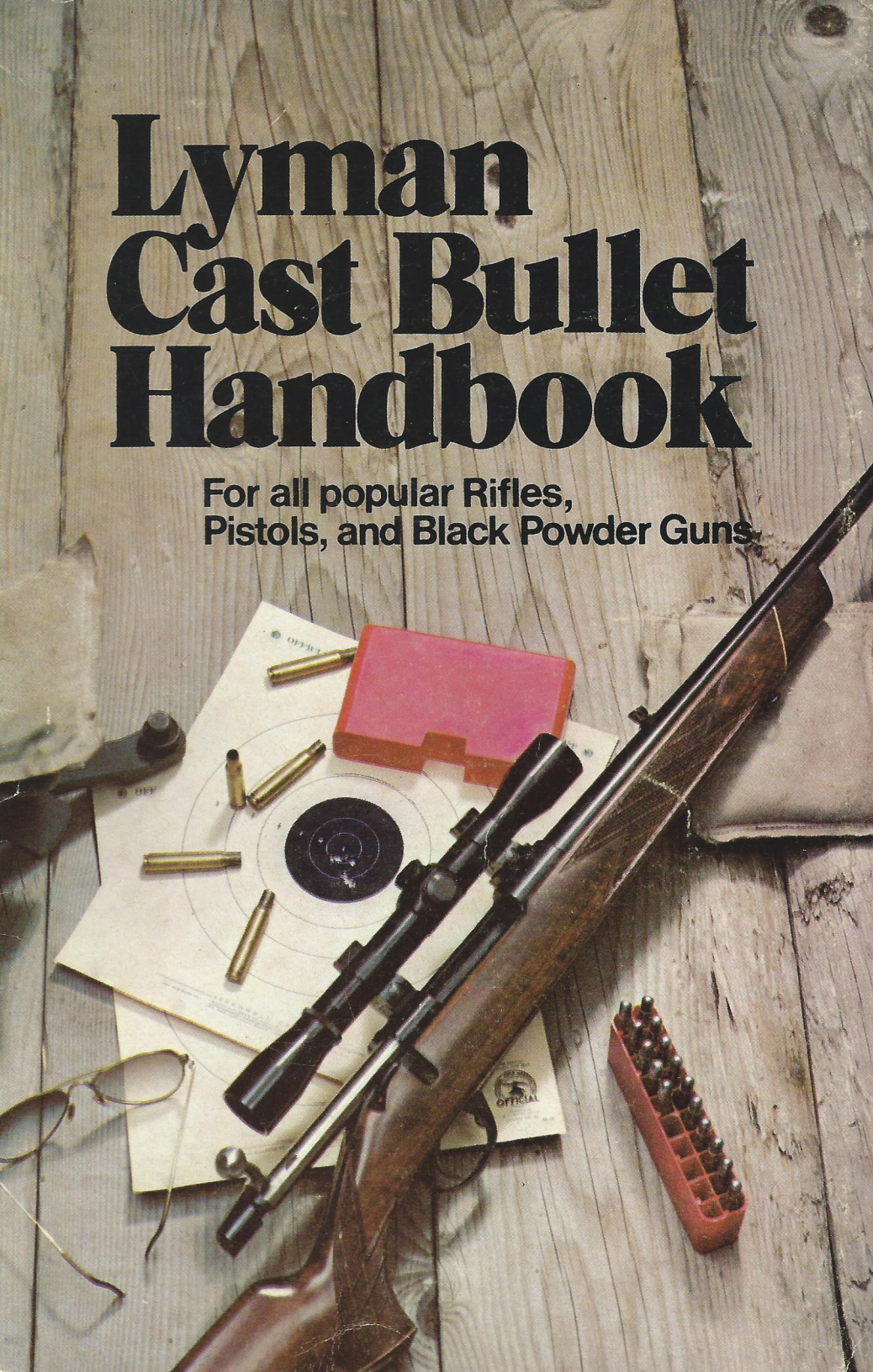
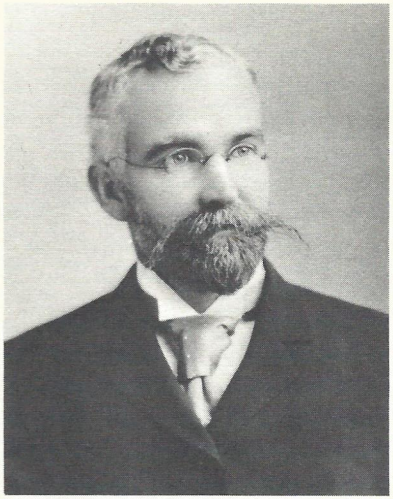
Lyman Cast Bullet Handbook

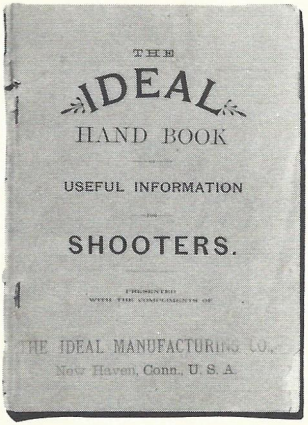
For all popular Rifles, Pistols, and Black Powder Guns





Nearly a Century of Service to the Shooter

From an inauspicious beginning in a corner of the family washing machine factory, William Lyman began a tradition which has remained the cornerstone upon which the Lyman reputation is built. The tradition of quality products at a reasonable price started with the first Lyman tang sight back in the early 1870's, and it continued as the Lyman product line expanded. By the turn of the century, Lyman had already begun producing reloading equipment. Thus, in 1925, when the opportunity arose to purchase the Ideal Tool Company, well known and respected for its line of reloading and bullet casting equipment, Lyman was more than ready to expand its commitment in the reloading field. One of the products acquired with the Ideal purchase was the Ideal Handbook, the first reloading guide published in this country. This Cast Bullet Handbook is truly a descendant of that line of popular handbooks.



Of course the Lyman line of reloading and bullet casting products has continued to expand and change in design. However, you can be sure that the tradition of providing the shooter with top quality products at a reasonable price remains.

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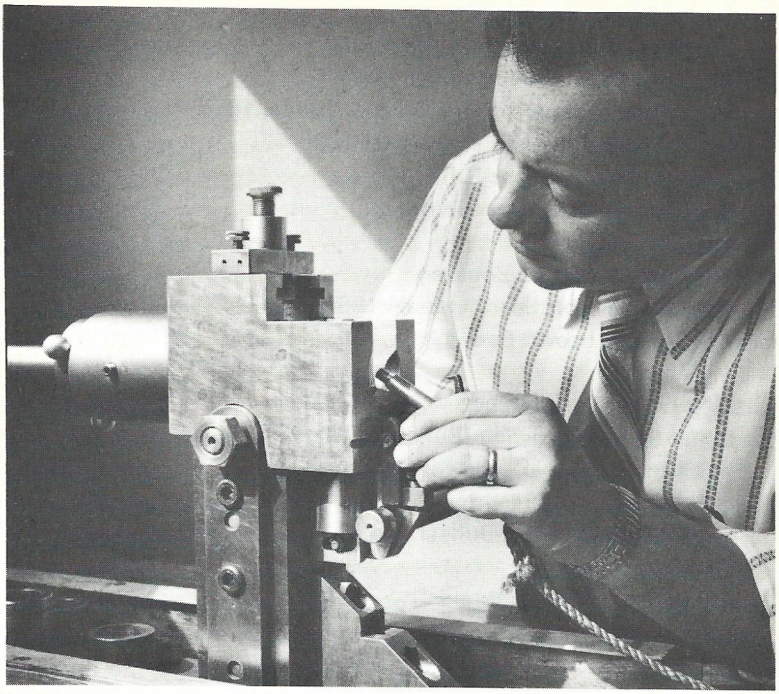
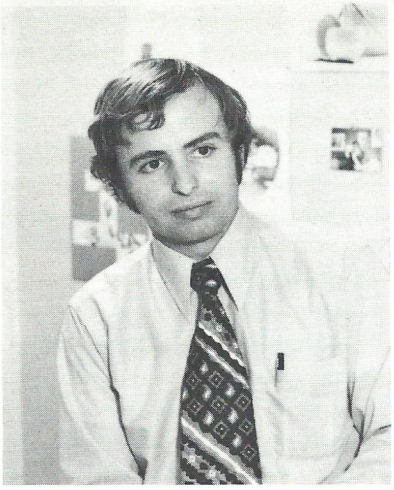


What Does it Take to Make a Lyman Handbook

The most important ingredient in this and any Lyman Handbook is people: The Lyman Technical Staff. Without this group of dedicated and experienced shooters, working tirelessly in the Lyman Laboratory and in the field, this book would not be possible. They have cast literally tens of thousands of bullets for thousands of loads in order to provide the cast bullet shooter with the most complete collection of cast bullet loading information and data available anywhere. The testing, checking and retesting consumed months. At times it seemed as though it might never end; however, with the encouragement and assistance of many component and arms manufacturers, importers, sportsmen and collectors, the task was finally completed. And so our work is done, but yours is just beginning. We sincerely hope that you will take advantage of our work to increase your enjoyment of the sport we all so greatly enjoy.



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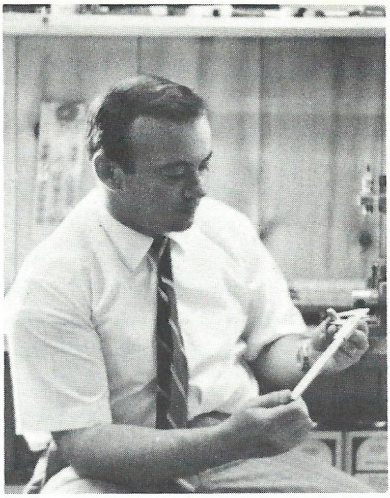

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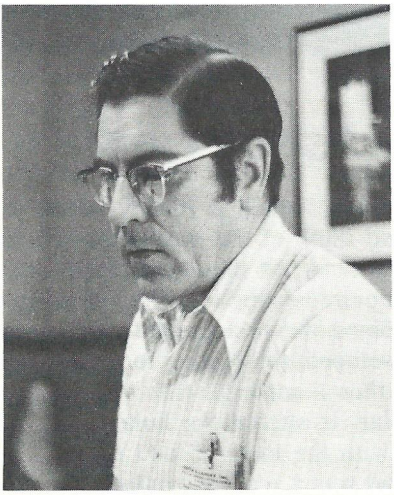

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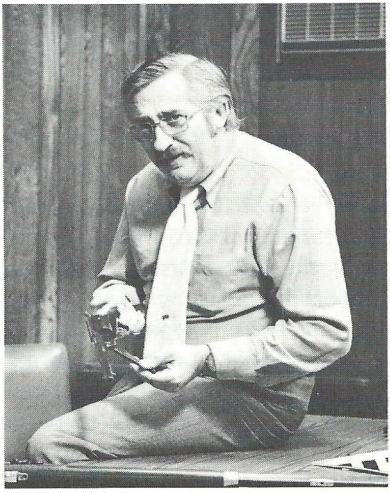

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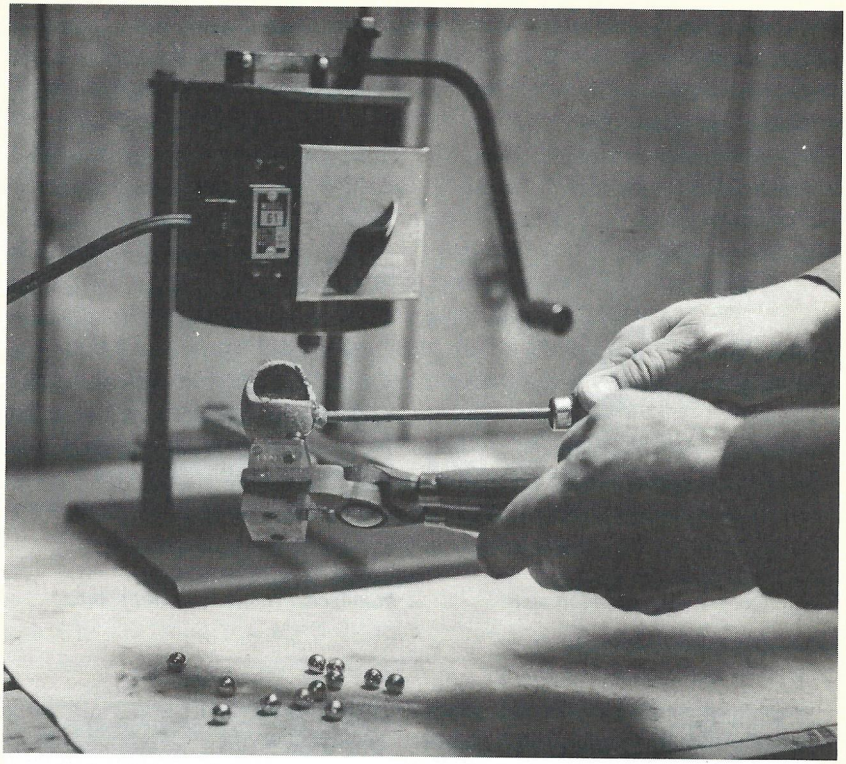


Why Bullets are Cast of Lead

Lead is probably the one metal available which is ideally suited as a bullet material. Stop for a minute and think of the properties that lead offers the bullet caster. The most significant of these is its workability. It is easily cast or swaged into the required shape and this, in no small measure, was responsible for lead being the first universally accepted bullet material. As early firearms developed, the tooling to produce bullets was extremely unsophisticated; thus a material that was as easily melted as lead was sure to be popular. It offered the bullet maker the ability to produce his bullets easily with the material and tools he had available at the time. In addition, lead was a readily available material. Although it was expensive years ago, it was still deemed better suited for the purpose of making bullets than any other material available. Through the years many replacements for lead have been sought, especially during war years when all sources of supply are reduced to a minimum. Many materials were tried. Steel, cast iron, zinc—all performed adequately, but to date none has equalled lead as an overall bullet-making material.

Today, of course, jacketed bullets may be purchased already made and ready to be reloaded. But stop for a minute and think just exactly what a jacketed bullet is. It is, in fact, nothing more than a lead bullet with a hard coating on the surface, that being the copper jacket. The jacket protects the bullet from the hot gases of today's new powders and, additionally, allows the surface of the bullet to hold rifling at higher velocities. Remember, however, that until the relatively recent development of jacketed bullets, cast bullets were making records on the target range and bringing down big game all around the world.

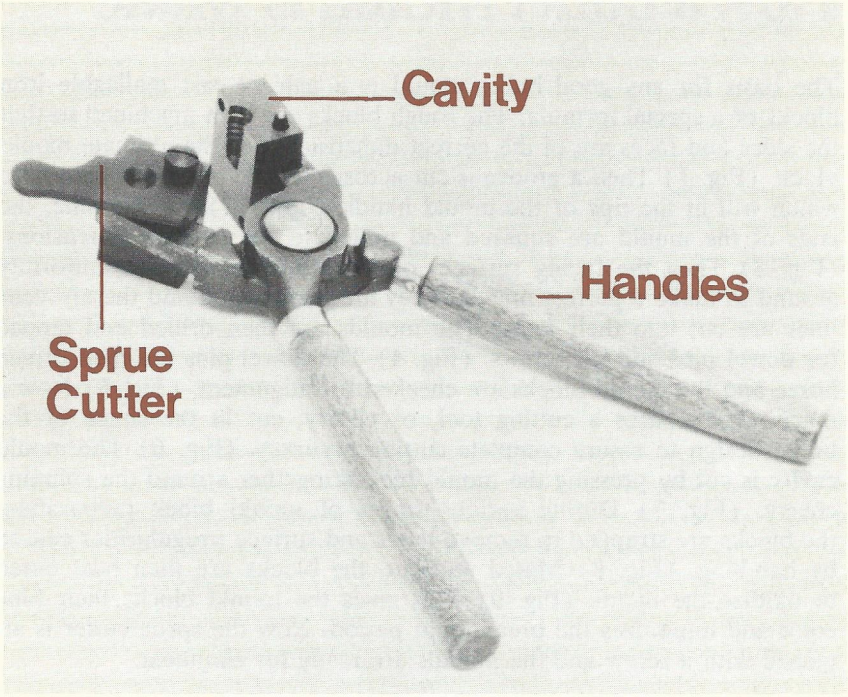
Economy is the main reason most people begin to cast bullets today. As the price of components continues to go up, the avid shooter and reloader looks toward cast bullets as a way to continue the enjoyable sport of shooting without spending a fortune to do it. Cutting ammunition costs in half, or better, is a generally accepted average. In fact it's quite possible, through judicious choice of components and larger quantity purchases, to reload some handgun cartridges at a cost of one-tenth the factory equivalent ammunition.

Another benefit is the great reduction in recoil in many rifles. Thus, greater amounts of shooting can be done without any ill effects to the shooter's shoulder. In addition, barrel life is almost indefinite since the cast bullet friction is much less than that of jacketed bullets, and barrel erosion due to hot gases is also drastically reduced. Many older guns with softer steel barrels would shoot out relatively quickly with today's jacketed bullets, whereas their useful life can be extended for generations through judicious use of cast bullet reloads. Moreover, many old barrels which are quite worn, or are of non-standard dimensions, can often be made to shoot well with cast bullets.

Additionally, cast bullets offer the reloader extra benefits not available with over-the-counter jacketed bullets. A good example is the ability to custom tailor the bullets to fit his individual gun. When casting bullets, the reloader has the option of sizing his cast bullets in a variety of diameters, thus fitting his bore diameter precisely to obtain the utmost accuracy.

Consequently, the benefits of cast bullet reloading are too great for the serious shooter to overlook.

Getting
Started
LYMAN

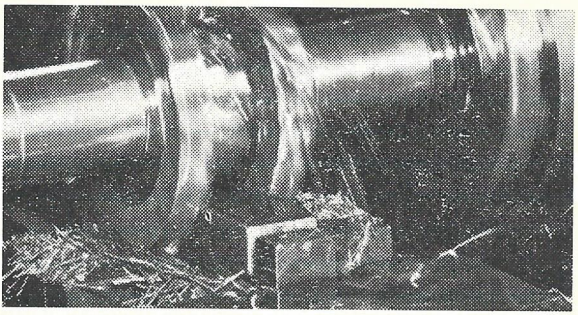


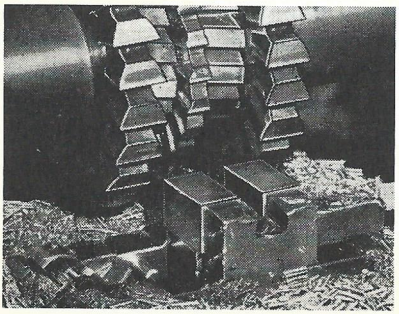
The Bullet Mould

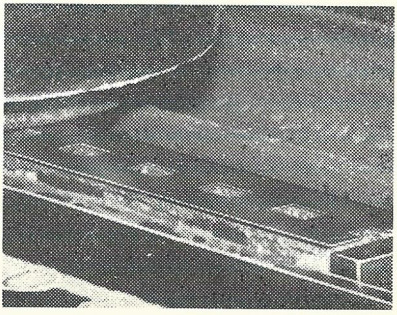
The Bullet Mould: The bullet mould is, of course, the first and most important piece of equipment you'll need to start making your own bullets. Today, you may choose from well over 500 bullet designs and weights. In addition, most every design and bullet weight is available as either a 1-, 2-, or 4-cavity mould, allowing the bullet maker to cast a number of bullets at once. Now, add to that variety of designs and moulds the option for hollow base or hollow point bullets. As you can see, the potential bullet maker has quite a variety of bullet mould choices with which to begin the enjoyable hobby of bullet casting. To make the decision easier, we suggest that the beginner consult the data section and choose a bullet for his cartridge which is of medium grain weight, and purchase either a single or double cavity mould initially. This will allow the beginner to start enjoying bullet casting immediately. Then he may consider a hollow point design after he has cast a "middle of the road" design and weight. Although simple in basic design, the Lyman bullet mould is a precision tool and its manufacture is a very precise operation.

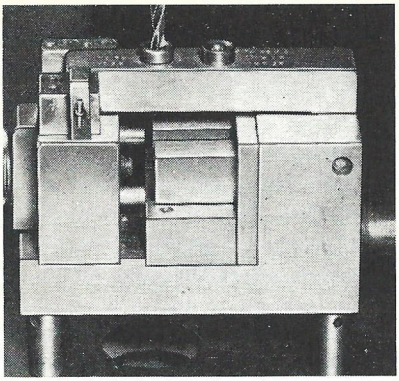
How a Bullet Mould is Made

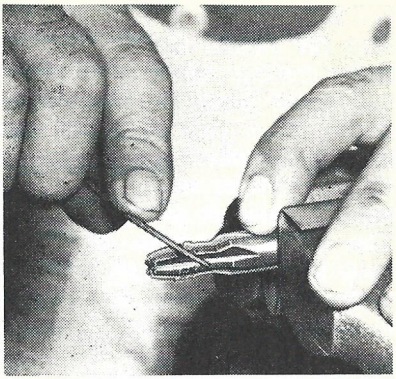
The basis for any good bullet mould is a pair of cast malleable iron blocks of a special formula. The rough blocks are then machined so that the sides and faces are of the correct dimensions for the ultimate mould block. (Fig. 1) Then a groove is cut across the side of each mould, into which will fit the tips of the mould handles. (Fig. 2) At this time, the ends of the mould are squared and milled to the correct dimensions. (Fig. 3) Then the facing surfaces of the mould blocks are uniformly ground to make a perfect match. They are then paired and the air vent lines are cut into their faces. The moulds are then drilled and tapped for dowel pins and set screws. (Fig. 4) The dowel pins are then driven home and the mould blocks are checked for alignment. (Fig. 5) Now a machinist prepares a cutting tool, or cherry, cut in the shape of the bullet design to assure complete cutting accuracy. (Fig. 6) The mould cavity is cut by pressing the mould blocks together around the spinning cherry. (Fig. 7) During various stages of mould block preparation, the blocks are strapped to remove burrs and surface irregularities caused by handling. (Fig. 8) Mated and cut, the blocks are then heat cured to oxidize the metal. (Fig. 9) This gives the mould blocks their blue color and minimizes the breaking-in period. Now the sprue cutter is attached with a screw and the moulds are ready for shipment.

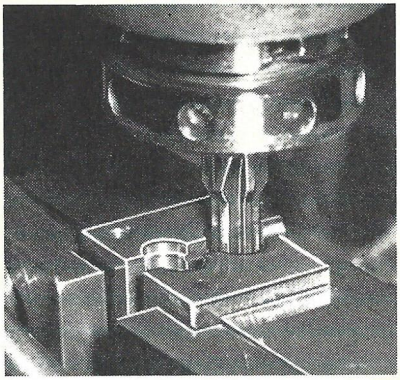


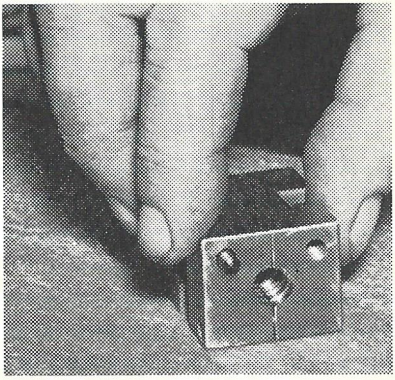


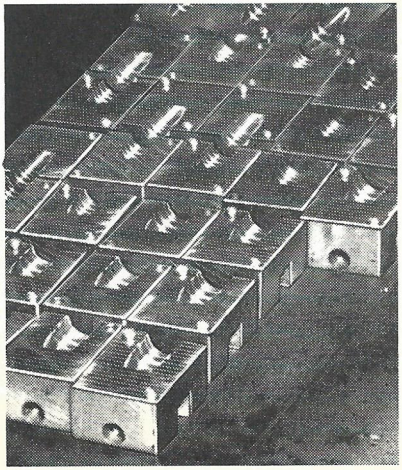


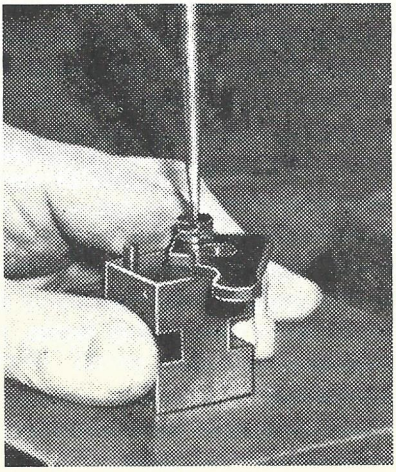






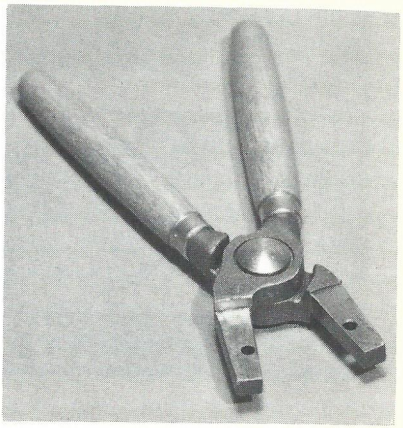






Mould Handles

We have shown the bullet mould with the mould handles attached. Bullet casting cannot be done without mould handles. Designed very similar to a pair of pliers, these handles will allow you to open and close the bullet mould while keeping the mould in precise alignment. The Lyman handles shown are quite simple and are of the double cavity size. They are also available in single and four cavity sizes. All have wooden handles to insulate against the heat of casting.

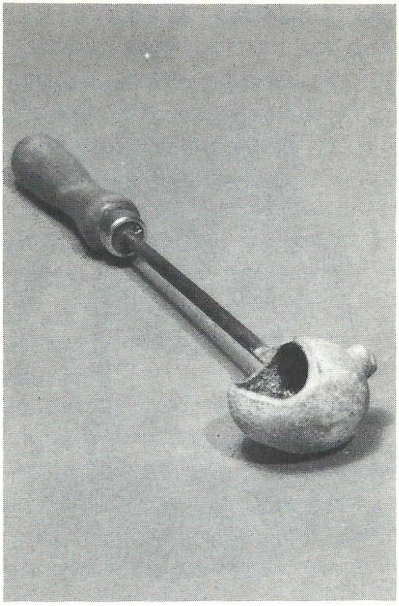


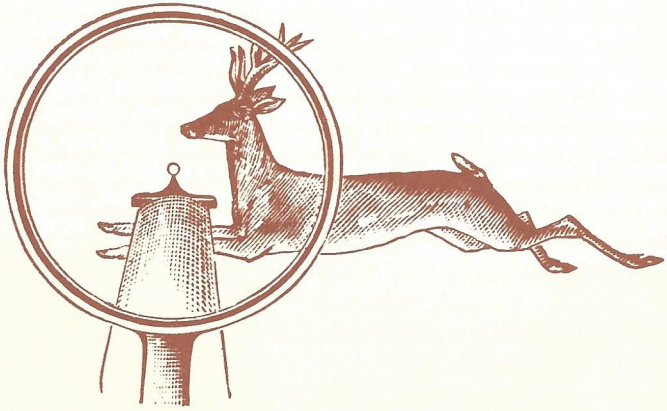
Casting Mallets

If the item shown appears to you to be a hardwood hammer handle, we're not surprised, because that's exactly what it is. Elaborately turned and more expensive commercially available mallets will do equally well. This simple piece of equipment is vital to correct bullet casting. It is used to open the sprue cutter on your mould without damaging either the surface of the mould or sprue cutter. Use only a wooden mallet for this purpose, since any metal instrument will surely damage your mould, requiring replacement of the sprue cutter or, possibly worse, replacement of the mould blocks themselves.

Dipper

To get the molten lead into your bullet mould, you'll need one of these. While it may be tempting to try a slightly less expensive or make-shift ladle, this will unquestionably be a mistake, as the Lyman ladle and other similarly designed ladles are uniquely suited for bullet casting. Their egg-shaped design allows rapid pouring of the hot metal into the mould, thus assuring evenly cast and filled out bullets. In addition, the cast iron design keeps the metal warm enough during pouring to maintain the proper flow. The spout, which mates with the top of your bullet mould, is specifically ground to insure a precise fit in the pouring operation, thus allowing maximum uniformity from bullet to bullet.





Electric Melting Furnace & Lead Pot

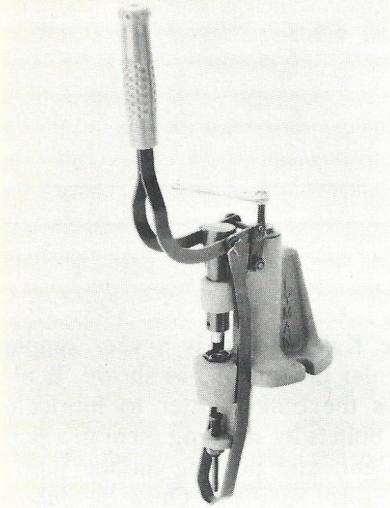
We'll describe the Lyman Bullet Casting Furnace first because, although it is not the only way of melting your bullet metal, it is, by far, the best and most controllable method of preparing your metal for casting. It offers the reloader a large (11 pound) capacity of metal and an adjustable thermostatic control to insure that his metal is heated to the correct temperature for optimum moulding characteristics. In addition to the convenience offered by this furnace and other similar competitive makes, it also offers the bullet maker the capability of bottom pouring. A spout on the bottom of the furnace may be opened and closed by the lever on the side of the furnace.

The beginner should initially use a dipper to learn casting; however, once experienced, he may then use the bottom-pour feature to greatly accelerate the casting operation. An alternative to the electric furnace is a "lead pot." This simple cast iron pot can fulfill essentially the same function as the large electric furnace when placed on a stove top burner, electric hot plate, or even heated over a propane torch. You may use this device to get started casting very inexpensively. Most definitely, it will do the job. However, there are a multitude of disadvantages. The most significant of these is the lack of precise temperature control as the bullet maker must estimate the metal temperature or purchase a metal thermometer. Of course, there is no bottom pour capability, and working on a range top can be quite inconvenient. In addition, working in the kitchen risks raising the ire of the woman of the house in the event of a spill or splatter of hot lead.

Ingot Mould

This simple cast iron device can be very useful to the bullet maker, allowing him to alloy metals and then cast them in convenient, easy-to-use ingots for remelting at a later time. Very inexpensive, this item is always a wise investment.

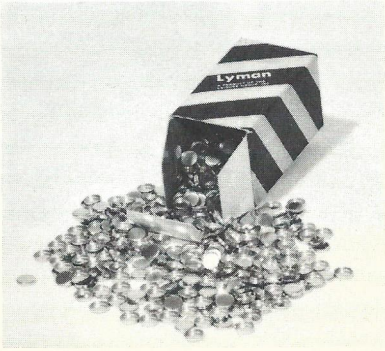
Lubricator/Sizer



To obtain maximum accuracy, most bullet casters prefer to size their cast bullets to a diameter which suits the barrel of their particular gun. The sizing is accomplished by swaging the cast bullet through a die which is bored to the desired bullet diameter. We have shown our 450 Lubricator/Sizer which both sizes and lubricates the bullets in one operation through utilization of interchangeable dies and a pressurized lubricant reservoir. The 450 will also seat and crimp gas checks on bullets designed to accept them. There are other methods to accomplish sizing and lubricating which will be discussed later.

Gas Check

Gas Checks are small metal cups in the diameter of the cast bullet. They are made of gilding metal and are applied to the cast bullet's base to protect it from the hot gases of the powder charge when the cartridge is fired. They are very effective in preventing barrel leading at high velocities and are used extensively on bullets designed for them.



Bullet Lubricant

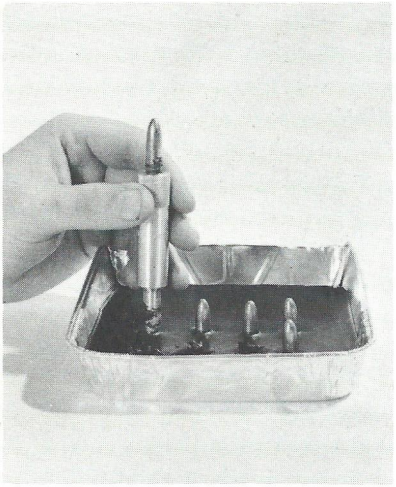
With only a few exceptions, any cast bullet you intend to shoot will have to be lubricated to prevent barrel leading. We've pictured a collection of Lyman lubricants prepared in stick form for use in our lubricator/sizer. However, there are any number of commercially available lubricants, many of which will do a good job for you.

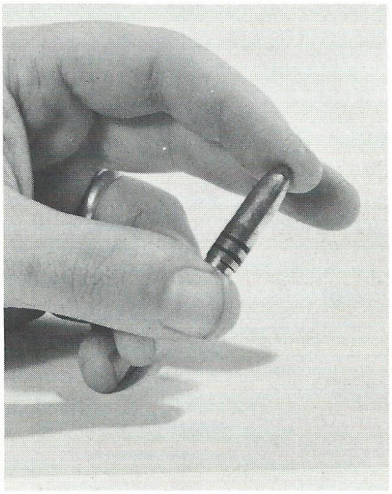
Kake Kutter

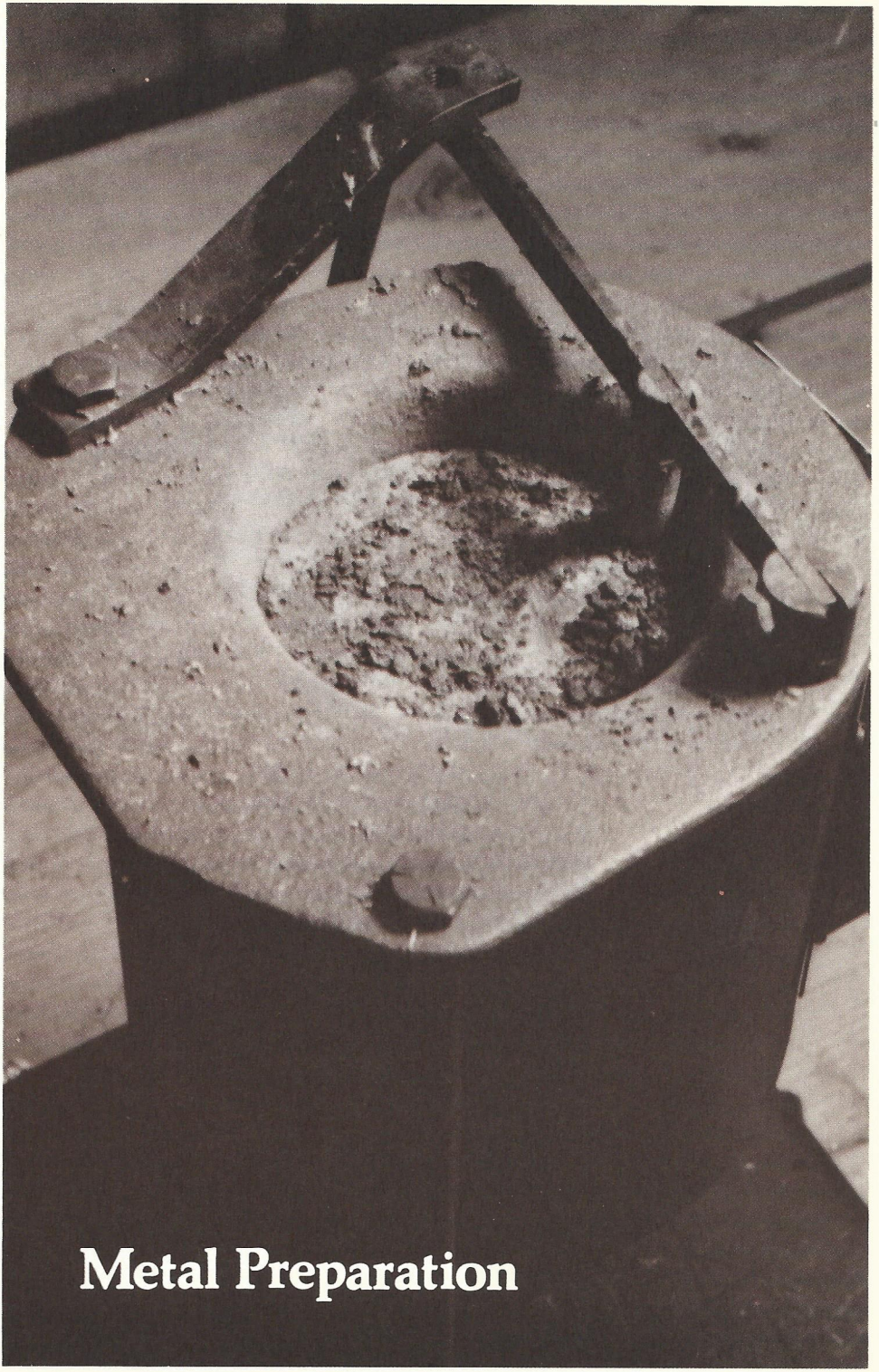
The Kake Kutter is a very simple tubular instrument, as shown. It allows the bullet caster to lubricate his bullets by standing them in a pan upright, and pouring molten lubricant around them. Once the lubricant has hardened, the Kake Kutter, turned to the diameter of the bullet, is pressed down around the outside of the bullet to cut it from the cake of lubricant. This method gives the bullet caster lubricated but unsized bullets. These bullets must then be sized in a separate operation.

310 Tool Sizing

A variety of sizing dies are available to fit the Lyman 310 Tool or tong tool. The bullets lubricated by the Kake Kutter method are then squeezed through the die in the 310 Tool to bring them to the correct diameter. Although this method is not as precise as using the lubricator/sizer, it is an inexpensive way to get started lubricating and sizing cast bullets.



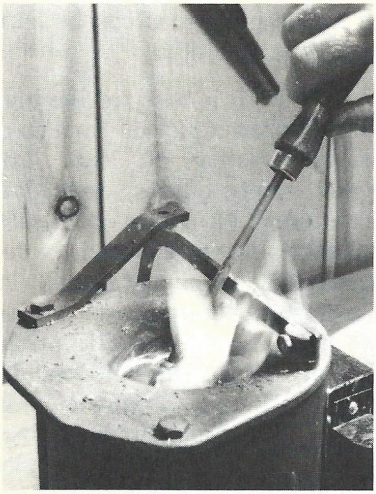


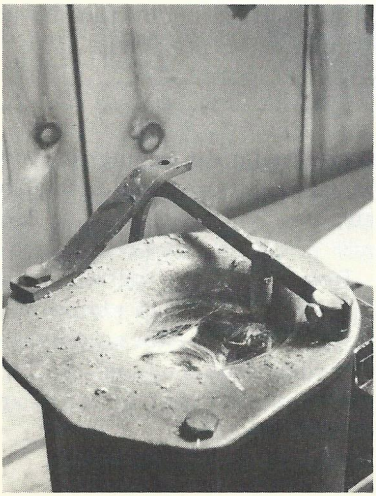


Metal Preparation

Metal Preparation

Whatever bullet metal you use, either a No. 2 mixture, wheelweights or linotype, metal preparation is essentially the same. First the bullet maker must melt his bullet metal until it reaches a consistency approximating light oil or water. Generally, with an electric furnace, 20 to 30 minutes of heating are required to bring a full pot of metal to the correct temperature. This waiting period can be well spent getting all of your other bullet casting material in order to begin casting. Once the metal has reached the proper temperature, a grey scum will appear on the surface. Do not remove this scum as it is tin, a very important part of your bullet alloy.



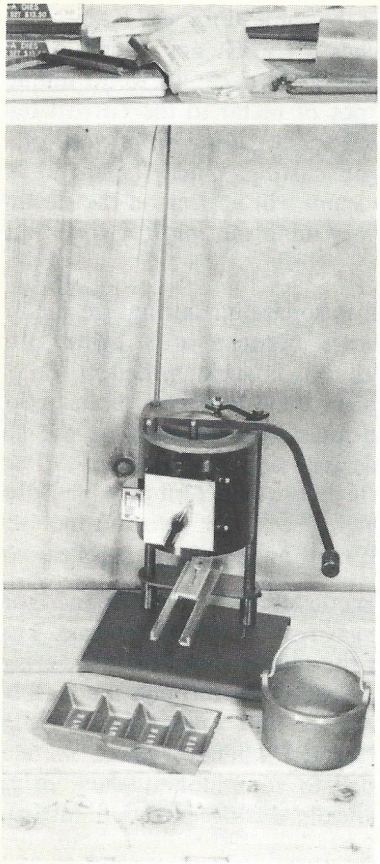


Tin is separated during the melting process because it is lighter than lead, thus floating to the top. To put this tin back into your bullet alloy, you must flux the metal in the pot. This is a simple operation. All you do is drop a small bit of bullet lubricant or bees wax into the metal. It will melt and begin to smoke.

Immediately light a match and ignite the gas rising from the surface. Then stir the mixture repeatedly, working the floating tin through the lead beneath it. This operation should be performed whenever more metal is added to your molten alloy, or periodically during extended casting.

After the fluxing operation is completed, the surface of the metal will appear mirror-like with the exception of a few black or brown impurities. These impurities may now be removed with your lead dipper and discarded, as they will only serve to make casting more difficult.

Safety

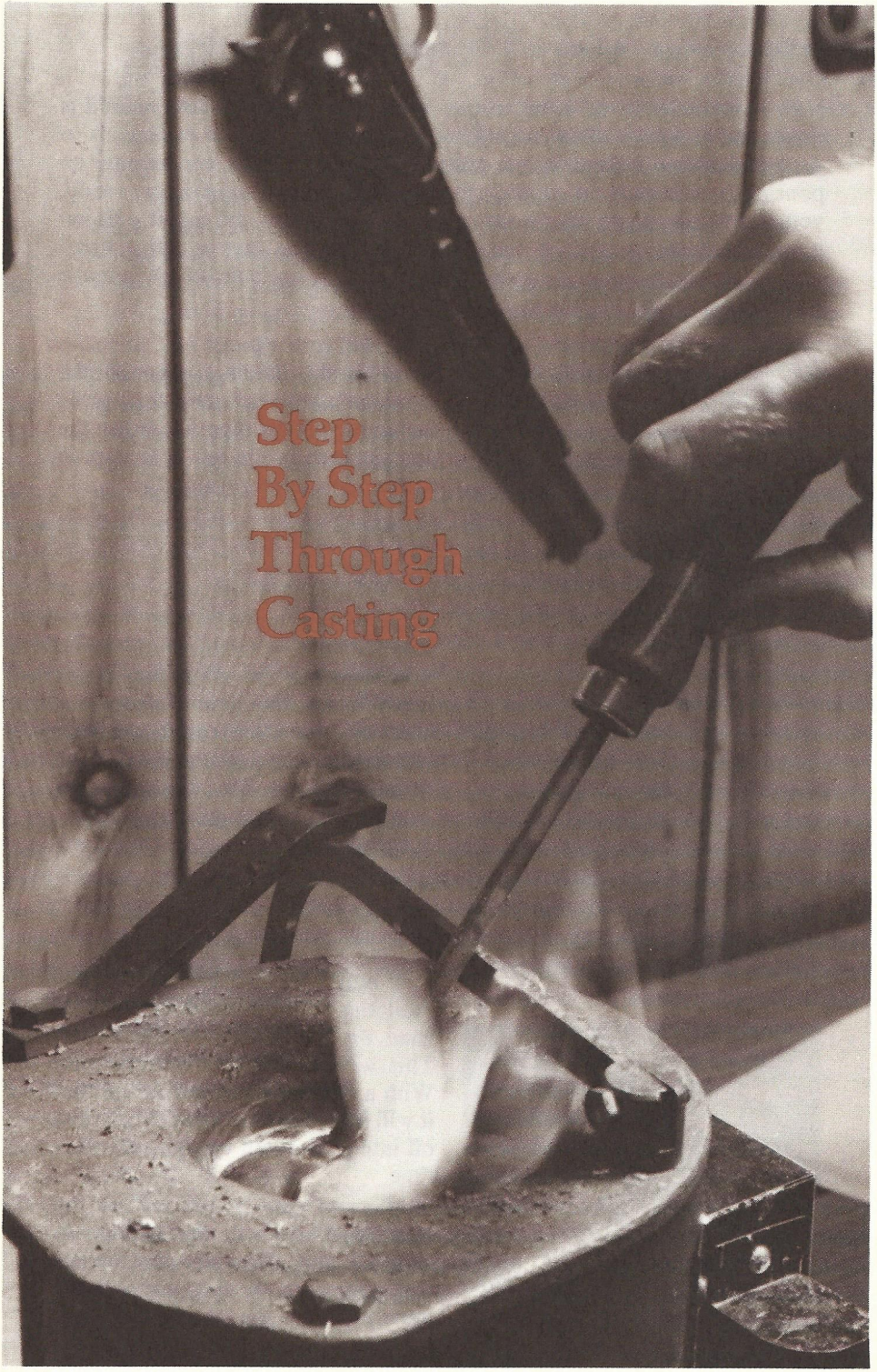


Cleaned and properly fluxed, your bullet metal is now ready to be made into bullets. A word about safety at this point. As bullet alloys are heated to melting temperatures, they release lead gas into the air in very small quantities. This is not anything to be overly concerned about. However, it is wise to cast bullets in an adequately ventilated area, thereby insuring absolute protection from the lead vapor which can be harmful in large quantities.

In addition, it is wise for the bullet caster to protect himself from an occasional spatter of lead. Long sleeves, safety glasses, even gloves are a good idea. The best safety measure is to prevent lead spatters. Insure that nothing can fall into your furnace from nearby shelves, and that goes double for primers and water. Yes, water and lead definitely don't mix. Drops of water falling into the molten lead actually explode into steam, spewing hot lead in all directions. Even a drop of condensation from an overhead water pipe can cause problems.

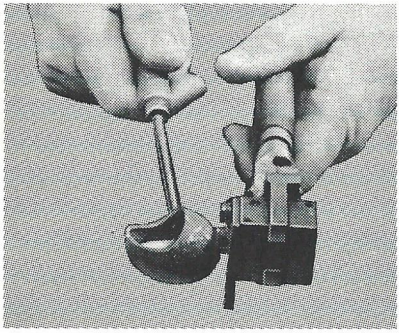
Mould Preparation

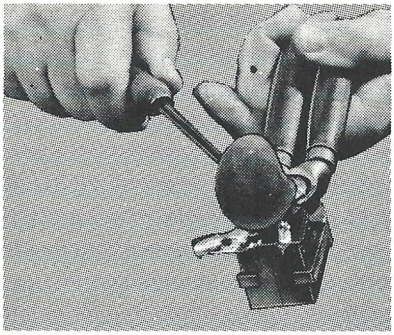
Before beginning casting, it is wise to examine your mould first. If it is new, you will notice that it has a layer of oil or rust preventative on it. Removal of this oil will greatly diminish the break-in period of the mould. This is easily accomplished by boiling your mould blocks in water and detergent or using some other oil solvent.

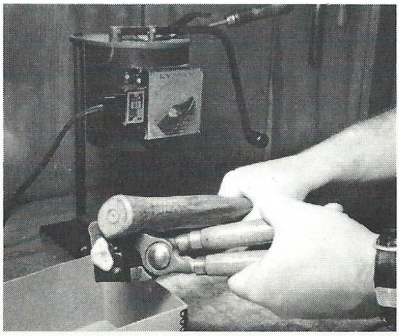

Step
By Step
Through
Casting

Step By Step Through Casting

Now your bullet metal is up to the proper temperature. Your mould is ready and you may begin casting bullets. The first order of business is to get yourself into a comfortable position so that you may concentrate on pouring good bullets. In addition to having your mould and dipper ready, you should also have your hardwood mallet close by and a soft cushion upon which you may drop the freshly cast bullets, thus avoiding damage to the warm bullets. A small cardboard box, or cigar box, will make a handy receptacle for hardened scrap alloy.

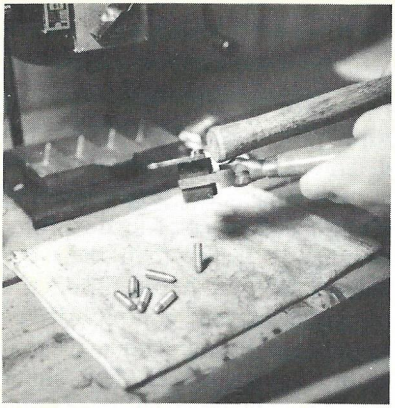




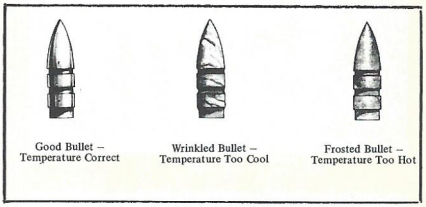


First, fill your dipper half full with metal and, holding your bullet mould in a horizontal position, place the spout of the dipper against the pouring hole in the top of the sprue cutter. Now, slowly bring the mould and dipper into a vertical position, rotating the dipper spout slightly in the pouring hole of your sprue cutter. With a little practice this will come in one smooth motion. The weight of the in-rushing bullet metal will force out the air in the bullet cavity. Once the mould cavity has filled out, let the excess metal flow slightly over the surface of the sprue cutter as shown. This extra metal is your sprue. When it hardens, your bullet will be ready to be removed from the mould. Now pick up your hardwood mallet and rap the sprue cutter sharply away from you. This will cut the sprue from the base of your bullet. Be certain not to do this until the sprue is thoroughly hardened on the surface of the cutter. This will take only a few seconds. With a little practice, you'll find that it will be possible to knock the sprue off into your scrap box almost every time.

Now, open your mould and let the cast bullet drop on the cushion in front of you. The first few bullets will come out of the mould quite imperfect. As the mould tempera-

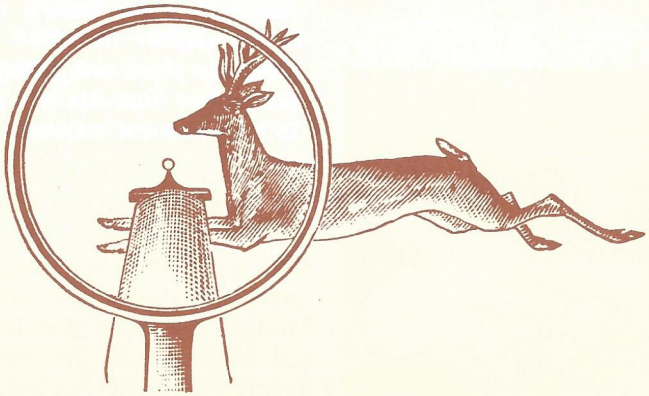


ture increases with subsequent casting, the bullet quality will improve until you begin to cast bright, sharp, clean bullets. The chart below shows good bullets and examples of bullets cast from a too hot or too cold mould. If the metal temperature is correct, you should be casting good bullets in no time.

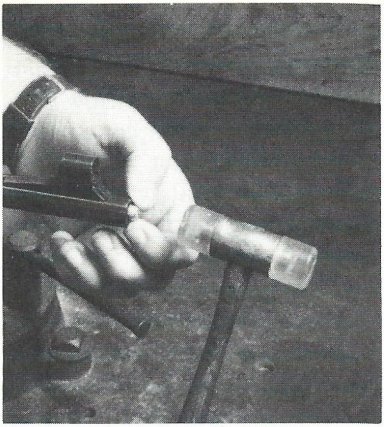


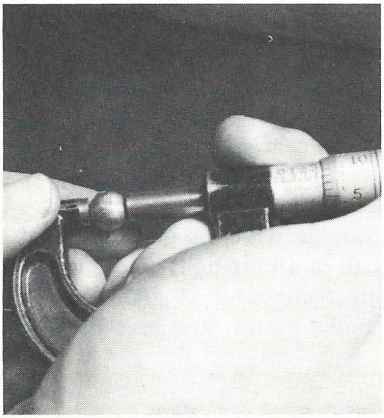
Mould Preservation

Once you have finished your bullet casting for the day, it is essential that you coat your bullet mould with a good rust preventative to preserve it for future casting. Another method of storage which is quite successful and often used is to place the mould block in an air-tight container with a couple of packets of desicant or drying compound. A good mould is something precious to the experienced bullet caster, and he will go out of his way to ensure its longevity.



Slugging The Barrel



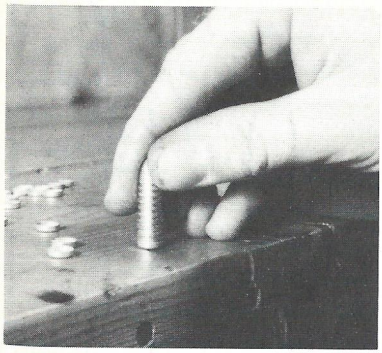


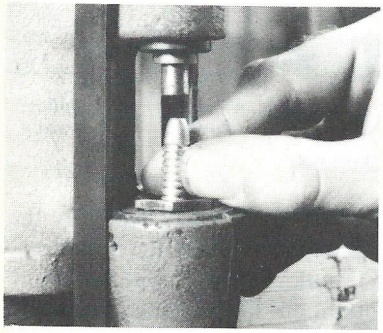
You now have a quantity of cast bullets. Now, to custom tailor these bullets to your gun, they will have to be sized or swaged down to the proper groove diameter of your barrel. To determine this groove diameter, you must first slug the barrel. Taking a soft piece of lead or round ball slightly larger than the inside diameter of your barrel, insert it in the muzzle of your gun and drive it through the barrel with a cleaning rod or wooden dowel. This should be done with ease, using a non-metallic mallet to insure that you do not damage the muzzle or the rifling as you drive this slug through it. The soft lead slug will not cause any damage to your gun if you carefully tap the slug through.

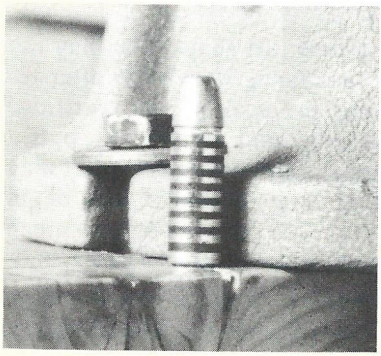
Once the slug is taken from the breach of your gun, it will have perfectly engraved land and groove markings on it. Measuring the diameter of the slug at its widest point with a micrometer will determine the groove diameter of your particular rifle. With this dimension, you can now size your cast bullets to fit the bore of the rifle perfectly. Although some bullets may shoot better slightly oversized or undersized in a given gun, sizing to the exact groove diameter is a good place to start in most instances.

Sizing

Sizing is most easily and efficiently accomplished with a sizer/lubricator like the Lyman 450. With this tool you may both size and lubricate your bullet simultaneously. Now that you have a collection of bullets and you know the correct groove diameter, you install dies of the correct diameter in your 450 lubricator/sizer and install a top punch which conforms to the nose configuration of your bullet. If your bullet calls for gas checks, apply the gas checks to the bases of the bullets by pressing each bullet squarely down on the gas check to fully seat it. Now, place the bullet into the lower die of the lubricator/sizer and firmly pull down the handle. This will bring the top punch down on the nose of your bullet and press the bullet through the sizing die, bringing it down to the correct diameter and firmly seating the gas check. Once the bullet has reached the bottom of the sizing die, turn the ratchet handle on top of the lubricator/sizer to force lubricant into the bullet grooves. Then raise the handle and check the bullet to see that it is sized and lubricated properly, and that the gas check is in place. Now you have a complete bullet ready for reloading. The 450 lubricator/sizer allows you to vary the bullet seating depth. With this feature you may lubricate only the lower grooves on a multigroove design, if you so desire.



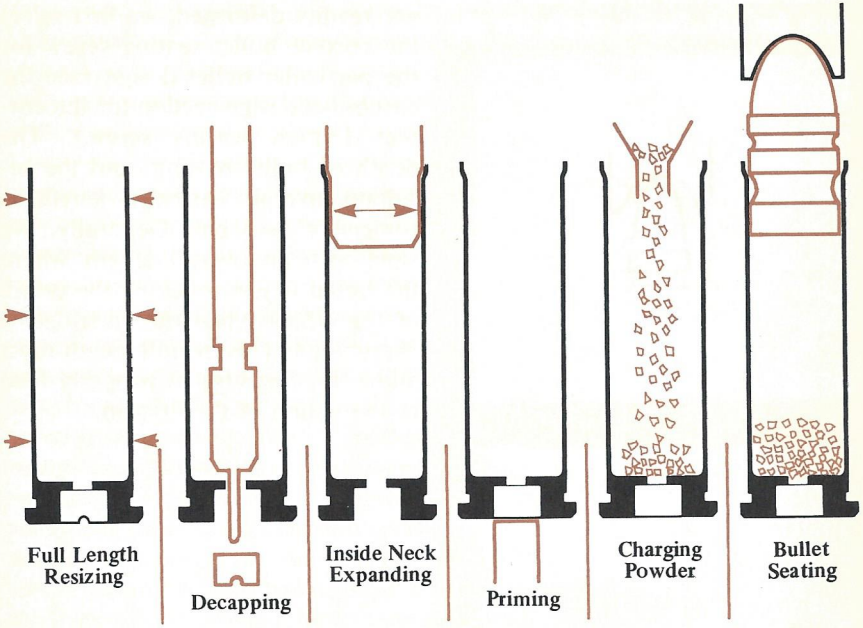




An alternate method of sizing and lubricating is available to a bullet caster through the use of a 310 sizing die and Kake Kutter. See Page 19 for description of 310 sizing and Kake Kutter method.

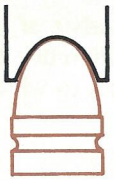
Loading Your Cast Bullets

Now that you have cast and sized a significant number of bullets, you are ready to begin reloading. There is very little difference between reloading cast bullets and reloading the jacketed bullets to which you may have become accustomed.

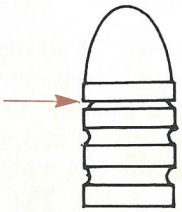


The six basic mechanical operations of reloading are still essentially the same: (1) full-length resizing; (2) decapping; (3) inside neck expanding; (4) priming; (5) charging; and (6) bullet seating. These can be performed with your present reloading equipment in most instances with the addition of the Lyman "M" neck expanding die. We'll go through the steps and show you how cast bullet reloading differs.

Full-length resizing and decapping is, of course, the same. You may use your existing full-length resizing die and decapping rod. Now, after resizing and decapping, the "M" die expands the neck of your cartridge case to the correct diameter for your cast bullet and, in addition, puts a very slight step on the end of the neck so that seating the cast bullet may be accomplished without shearing any lead from the bullet. The depth of the step is adjustable on the "M" die; thus, you may use only as much as needed. Priming and charging of the cartridge case after neck expanding is the same as with conventional reloading.



The seating of cast bullets is little different from the seating of jacketed bullets. However, because cast bullets are available in many different point configurations, and such points are readily deformed, we first select the correct bullet seating screw for the particular bullet design (see the cast bullet design section for the correct Lyman seating screw). The depth of bullet seating, and the resultant overall cartridge length is somewhat variable. Generally, we start with an overall length where the bullet is just touching the origin of the rifling when the cartridge is chambered. This overall length must allow the cartridge to properly feed in the action of the firearm.



Many cast bullets also offer a crimping groove. Whether the reloader uses this groove or not is entirely up to him. Best accuracy, as with jacketed bullets, is obtained by not crimping. However, for field loads which must withstand a certain amount of abuse, crimping is recommended to prevent the lubricated bullet from sliding from the case neck under recoil. This is especially true with revolvers.

Performance Cast Bullet Shooting

Performance Cast Bullet Shooting

We have read all too often that with cast lead bullets, we must settle for 3 inch groups at 100 yards, simply because cast bullets will not deliver better accuracy. This old wives' tale has derived from the period in time when most factory rifles were not capable of delivering accuracy better than 3″ with any bullet design. Today's rifles are superbly accurate and, generally speaking, the level of accuracy obtainable with jacketed bullets in a given rifle is often obtainable using cast lead bullets.

The preceding chapters outlined the techniques which are necessary to manufacture cast bullets. We must now examine the final steps necessary to allow such ammo to perform in the desired manner. The old masters of the single shot rifle era developed the art of shooting cast lead bullets to its peak. After the advent of the high velocity, high performance rifle cartridge, we evidently lost the art these riflemen developed.

We know that the most accurate load for a jacketed bullet is generally not a load delivering the highest velocity. The same is true for cast bullets. You will consistently find peak accuracy is obtained when you load below peak velocity.

Therefore, when you desire maximum accuracy with cast bullets, you must ignore the world of the 3000 FPS jacketed bullet and enter the world of the 2000FPS cast lead bullet. The loads recommended in this handbook have been selected on the basis of uniform velocity and pressure within an extensive string of shots.

This uniformity dictates the performance of the bullet during its flight. The bullet's flight path depends on the component's action on the bullet before it leaves the muzzle. Variances in velocity will alter the point of impact. Such variances are not only caused by poor loading data, but also are affected by primers, positioning of the powder at the time of ignition, friction of the bullet held by the case neck, and the position of the bullet in the chamber. Let's see how to cut down the number of variables.

Accuracy From Your Cast Bullets

Accuracy begins with a good and serviceable casting containing no visible flaws or internal voids. Consider those bullets which have the reputation for accuracy today: the super accurate jacketed match bullet.

The components of this jacketed bullet are processed under extremely careful conditions. The jacket is drawn to provide extreme uniformity. Next the lead core is swaged under tons of pressure to eliminate all voids and to yield uniform dimension. The components are then joined under tremendous pressure, giving the bullets extreme uniformity in weight and size.

This quality level is readily obtainable when casting bullets in your own home. However, to obtain this quality, you must apply controls similar to those used by the manufacturer of jacketed bullets. If you accept second-rate quality in cast bullets, you will have to settle for second-rate accuracy.

The bullet mould is a tool which gives you an object which can be made into an accurate projectile. The bullet as it comes from this mould is not automatically accurate. Examine it carefully. The bullet is of the desired shape; however, it has a mould parting line on it and it is slightly oversize. It has lubricant grooves around its circumference, and these grooves may or may not have sharp corners. Last, but not least, there is a mark on the base of the bullet which shows where the lead entered the mould.

The first step toward accurate bullets is uniform castings. You must establish a casting technique whereby you cast each bullet in an identical manner.

Each mould requires its own casting technique, temperature, pouring speed and venting. Your object is to fill the mould cavity completely so that there are no voids, all grease grooves are completely filled out, and the sprue is cut cleanly without leaving a pocket.

Adjust the temperature of your alloy until you are satisfied that the lead is hot enough to completely fill out all sharp corners of the bullet.

Next, experiment with different techniques of pouring the lead into the mould. Vary the speed and volume of the pour and the contact of the pouring nozzle, to either seal off the mould opening or allow venting of air from the opening, until you are satisfied with both appearance and uniformity of the castings. Your next step toward uniformity is the period of time between castings. This period is primarily dictated by the appearance of the sprue.

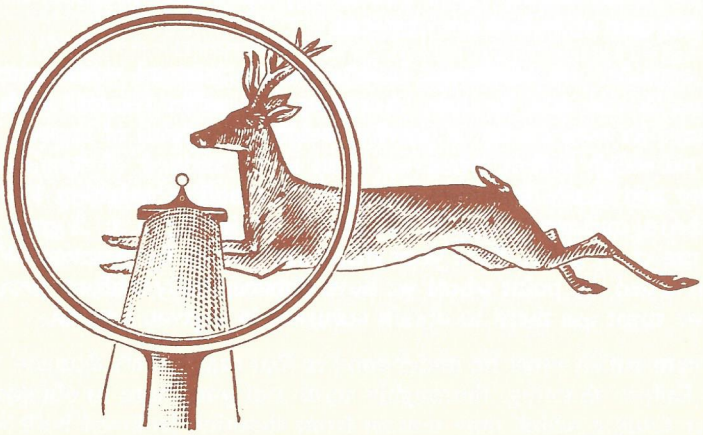
Your casting must be allowed to cool to that point where, when the sprue is knocked off, you are not left with a pocket in the base of the bullet. These pockets occur when the sprue is removed prematurely, because

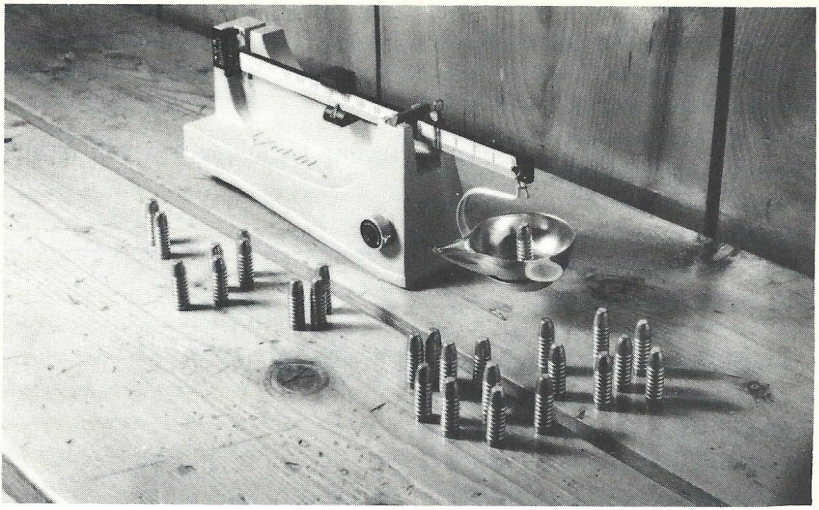
the hot lead, lacking full strength, will tend to tear and pull out lead from the casting, instead of giving a clean shearing action. Time the frequency of your pours to allow the sprue to chill properly prior to removal, or consider casting with two moulds, alternately casting and cooling each mould.

Once you have established a good casting technique you will produce bullets of shooting quality.

Inspection For an Accurate Cast Bullet

You have just manufactured a quantity of cast bullets. Like all manufacturers, you must now eliminate all defective bullets. Discard any bullet which has visible surface defects as described in Section III. Just put them aside for remelting. If some of your bullets have pockets in the base, save them for sighters and practice shots. You have now reached one plateau of accuracy: bullets showing no visible defects. Bullets from this batch will give you excellent accuracy; however, as you begin shooting with these bullets, you will note an occasional flyer which jumps out of an otherwise excellent group. This unexplained flyer is what you must now eliminate by additional inspection.



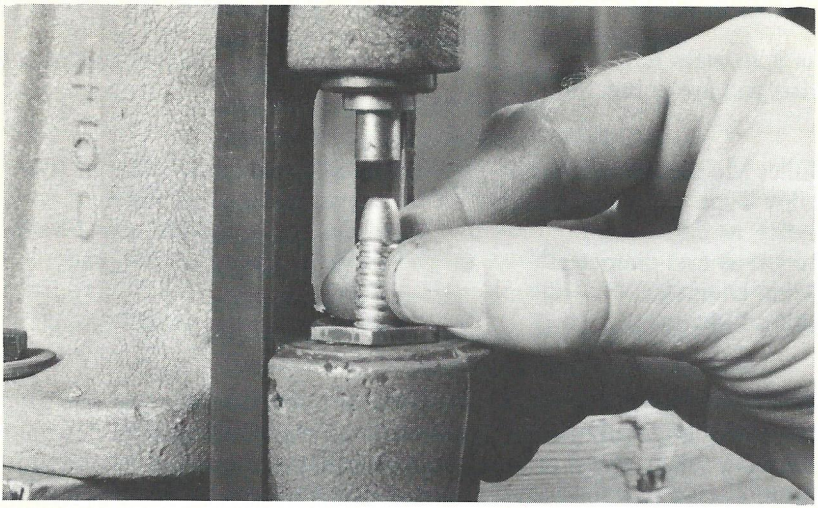


Weighing Bullets For an Accurate Reload

Cast bullets are weighed to detect voids or porosity in the bullet. These voids occur when air becomes entrapped in the mould during the pour, and will have a significant effect on accuracy. This becomes increasingly important when small caliber bullets are cast. Consider 10 bullets, each having an internal void exactly in the same location, central with the axis of the bullet. These bullets will shoot with excellent accuracy, as in this case all bullets are identical.

Now consider 10 additional bullets having internal voids completely random in size and location. Accuracy will suffer because each bullet will have its own center of gravity, weight, and point of impact. Therefore, we weigh bullets when we want to be assured of consistent uniformity and desire optimum accuracy. For bullets weighing 150 grains and above, uniformity can be obtained by weighing to $\pm$ .2 grain; below 150, use $\pm$ .1 grain. Save your discarded bullets for practice. We have now reached the point where we have dimensionally uniform projectiles; now we must use these to obtain accuracy in a given firearm.

One item which must be understood is that cast bullets demand a clean bore. Before shooting, thoroughly scrub out your bore to eliminate any copper fouling which may remain from shooting jacketed bullets.



Sizing For an Accurate Reload

If you have not already done so, slug your bore as outlined in page 26. Record the diameter of the slug and keep this dimension in your records for future reference.

Having obtained the groove diameter of your firearm, you are now ready to select the correct sizing die and top punch. To size and lubricate your bullets, the best place to begin is by selecting a sizing die which is the same diameter as groove diameter of the barrel. If this exact die is not available, select a die .001″ or .002″ larger in diameter.

Take several of your rejected bullets and begin sizing and lubricating; adjust your lubricator/sizer until the bullet is fully sized and all grooves are filled with grease.

Now you are ready to begin sizing your match grade bullets. Up to now, you have taken great care to produce accurate projectiles; with the same care, continue by placing the bullet in the center recess of the die. Bring the nose punch down on the bullet and continue the down stroke until you reach the stop.

Do not apply excessive pressure to the handle, as this will tend to deform the nose of the bullet. Now crank in the lubricant, filling all grooves. After lubricating, store your bullets, base down, in a box until ready to load.

Working-Up a Cast Bullet Reload

As you begin developing your load for a given firearm, keep records of what you are doing. Such records should contain:

Bullet Mould No.
Alloy Type
Bullet, as cast weight
Bullet, as cast diameter
Sizing Diameter
Bullet Lubricant
Make, Model and Caliber of Rifle
Groove Diameter of Rifle
Powder Type, Lot No. and Charge
Primer Number, Lot No. and Manufacturer
Overall Cartridge Length

These records will become invaluable when you record group size along with such data, and begin to make slight changes in loads. At this point, you have taken every precaution to manufacture uniform match grade ammunition. You now must prove or disprove the performance of the ammo on the range. When developing any load, perform your testing from a sturdy sand bag or mechanical rest. Again, remember to begin with a clean bore.

One way to begin testing on a specific caliber is to load up several cartridges using several of the powders recommended for the specific bullet and caliber. When using this technique, select the suggested starting load in each powder type. By carefully performing this test, you will immediately see if your particular firearm-cartridge combination has a preference for a specific powder. You may then single out that powder to further develop your accuracy load.

As you begin to work up your accuracy load for your particular firearm bullet, you will encounter a host of variables which will affect accuracy performance. The first and most significant factor will be powder. This is why we use the above technique in our attempt to quickly isolate the preferred powder type.

It has often been said that the next step is to try different diameters for your cast bullets. However, you may not have the various dies available, and if you have reasonable groups to begin with, chances are that your bullet diameters are correct. Look for a change in bullet diameters only if your initial results are completely unsatisfactory.

If you kept good records during this test, you should not only have your performance (grouping) information, but you should also have recorded the changes of point of impact. Such information may prove quite valuable at a later date. .

Now that your load has been refined by the selection of the correct powder and charge and is rapidly approaching the desired accuracy level, you must begin to look elsewhere to further improve accuracy.

The next step is to vary the seating depth of your bullet. Carefully adjust overall length in a search for any improvement in accuracy. Again, record all information.

No review of accuracy with cast bullets would be complete unless problem areas are identified and means to overcome these problems are explored.

Occasionally you will find a rifle which just does not want to perform with cast bullets. When such a problem does present itself, a careful review of the load is in order.

Reaffirm the fact that the bullet design selected is correct for the caliber and twist of the rifle. For example, if you have selected a bullet weighing 250 grains and are shooting in a barrel with a twist rate which is optimum for 150 grains, your problem is one of selecting the correct design for the rifle.

Often a poorly shooting rifle can be made to perform simply by changing the alloy of the bullet, i.e., from a hard to a soft alloy. The final potential change is with the bullet lubricant. A very simple way to experiment with different lubricants is to use the Kake Kutter technique. You would lubricate your bullets in this manner. Then remove the sizing die from your lubricator/sizer and thoroughly clean the die. Remove all traces of lubricant.

Insert the die back into the lubricator/sizer and size all the bullets lubricated by the Kake Kutter technique, making sure that you do not pressurize the lube in the sizer.

You have just completed the major tasks necessary to develop your cast bullet accuracy load. It is interesting to note that the technique used is no different from that used to develop a load for jacketed bullets. With cast bullets, however, you have the added option to vary the diameter of your bullets, an option not readily available with commercial jacketed bullets.

The Cast Hunting Bullet

Performance of any bullet design, either cast lead or jacketed, is related to the firearm it's used in, the flight of the bullet, and its action on the target.

With the hunting bullet, the desired action on the target is the immediate downing of the animal, and the cast bullet, used in either handgun or rifle, has for countless decades taken all types of game. When used for this application, certain specific rules must be adhered to in order to achieve the desired performance.

The hard alloy bullet used for target shooting would, very likely, pass completely through an animal without noticeable expansion, much the same as the full patch jacketed bullet. We therefore almost always select a soft alloy, such as 1-15. (See bullet alloy appendix, page 236.) An alloy such as this will provide excellent expansion on game with the proper bullet design.

The design of the bullet is a very important factor. The recommended shape is either a flat or round nose, solid or hollow point, gas checked bullet. The hollow point cast bullet, designed exclusively for hunting, will expand more rapidly than the solid nose design, and has been used with great success for many years.

The design selected should allow all grease grooves to be seated within the case neck and should yield an overall length which will function smoothly through the action of the firearm.

The lubricant used must be the best available in order to achieve the desired hunting velocity without leading. We strongly recommend the use of Lyman Deluxe Lubricant.

Developing The Hunting Load

When developing a target load, we strive for accuracy and tend to discount velocity. With the hunting load, we reverse this procedure. We first establish a desired velocity which will give the desired performance on game. We then set an accuracy limit to be achieved at the desired velocity.

A reasonable limit for accuracy of the hunting bullet is 3 inch groups at 100 yards for rifle and 4 inch groups at 50 yards for handguns. Such accuracy limits will provide all the required performance on deer size game at the ranges that such game is normally encountered. We are aware that a soft lead alloy bullet cannot be fired at high velocity, rapid fire, in a hot barrel, without inviting leading problems. We also know that during hunting we will generally be firing one to three shots through a cold barrel. Therefore, when testing to develop a hunting load, keep conditions similar to what you expect to find in the field. Fire for accuracy using three-to five-shot strings. Allow the barrel to cool between strings much as it would while hunting.

It is often very satisfying to check your bullets periodically for expansion. Testing for this factor is limited only by the imagination, as there are many methods which will serve as an indicator of expansion. A stack of wet newspapers or thick telephone books will not only show you the expansion, but if properly stacked, such a test device will also show an indication of the wound channel.

You can also use a pine board baffle box, noting the degree of penetration and expansion of the exit hole on each board. And, finally, even a sand bank can be used to test expansion with good results. Of course, as with all cast bullet shooting, experimentation is the byword when building a good cast bullet hunting load. However, a good hunting load, based on either cast or jacketed bullets, can never replace a well aimed shot.

Reloading Data Preamble

The data offered here was gathered through extensive testing and re-testing, and supercedes all previous cast bullet data. Before using these loads, the reloader should consider the variables involved. The components and firearms used to collect this data were provided by a variety of manufacturers, collectors and shooters. The reader should bear in mind that the data prepared is based on the specific collection of components and equipment listed for each cartridge. This data will provide a good departure point to begin preparing custom-made loads for the individual reloader's gun; however, we have no control over the manufacture of the products. Moreover, production changes affecting the performance can occur at any time, so the reloader is cautioned to carefully scrutinize any components he may plan on using before reloading.

It is wise to record the manufacturer, type and lot number of the primer being used. Do not mix lots of primers within a given load. Fully seat primers with uniform pressure.

When shooting for accuracy, use cases of one manufacturer, and preferably from the same lot. Trim all cases to the same overall length—uniformity is the byword—and perform each sizing or expanding operation in a uniform manner.

You may elect to weigh each powder charge, or if the powder granulation is fine, you may elect to charge each case directly from the powder measure. Whichever technique you use, perform each operation in a uniform manner. By far the safest way to begin is to weigh each individual charge.

To assist the reloader in preparing a good, safe reload for his gun, we have offered starting loads. If the reloader will start with one of these and work up until he gets maximum accuracy from his gun, he should experience no real problems, assuming his gun is in good repair. Never decrease the charge below the starting load, as an unusually large increase in pressure may result.

While we have listed maximum loads in this handbook, this does not mean that these are maximum loads for the individual reloader's gun. Here, again, adherence to good reloading technique and building from the starting loads recommended will assure that unsafe pressure conditions are not encountered during shooting.

The reloader interested in supplementing this cast bullet data with jacketed bullet information may look to the 45th edition of Lyman's Reloading Handbook. It was prepared with the same care as this handbook, and can be an invaluable source of data.

Reloading Data

.22 HORNET

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .223″
Maximum Case Length ..... 1.403″
Trim to Length ..... 1.393″
Maximum Overall Length (With Bullet) ..... 1.723″
Primer Size .....Small Rifle
Lyman Shell Holder Number 4

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester 6½-116
Cast Bullet Used .....*225107 - 38 Gr. 1.642″
*Gas Check *225438 - 45 Gr. 1.675″
*225415 - 50 Gr. 1.694″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Winchester Model 54
Barrel Length .....24″
Twist .....1-16″
Groove Diameter ..... .223″

NOTE: Two distinct groove diameters are encountered in rifles chambered for this cartridge (.223″ or .224″). Some of the earlier rifles make use of a .223″ groove barrel while all of the more current models have the .224″ groove. The reloader must insure that his bullet diameter corresponds to the groove diameter of his particular rifle. All of the data listed was compiled in a .223″ groove barrel.

38 Gr. (w/Gas Check) Bullet #225107 (#2 alloy)

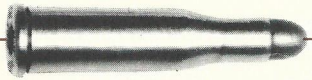
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	2.0	1210	4.0	1945
Green Dot	2.5	1350	4.5	2040
Unique	3.0	1400	5.0	2115
700X	2.0	1225	4.0	1965
PB	2.5	1350	4.5	2000
SR7625	3.0	1490	5.0	2155
230	2.0	1230	4.0	1960

45 Gr. (w/Gas Check) Bullet #225438 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	2.0	1095	3.8	1730
Green Dot	2.5	1245	4.3	1835
Unique	3.0	1365	4.7	1845
700X	2.0	1105	3.8	1730
PB	2.5	1225	4.3	1780
SR7625	3.0	1380	4.7	1875
230	2.0	1110	3.8	1740

50 Gr. (w/Gas Check) Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	2.0	1060	3.7	1645
Green Dot	2.5	1230	4.2	1765
Unique	3.0	1320	4.6	1805
700X	2.0	1050	3.7	1665
PB	2.5	1185	4.2	1705
SR7625	3.0	1350	4.4	1745
230	2.0	1060	3.7	1660



.218 BEE

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .223″
Maximum Case Length ..... 1.345″
Trim-to Length ..... 1.335″
Maximum Overall Length (With Bullet) ..... 1.680″
Primer Size .....Small Rifle
Lyman Shell Holder Number 10

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester 6½ - 116
Cast Bullet Used .....*225107 - 38 Gr. 1.532″
*Gas Check *225438 - 45 Gr. 1.550″
*225415 - 50 Gr. 1.595″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Winchester Low Wall
Barrel Length .....20″
Twist .....1-16″
Groove Diameter ..... .223″

NOTE: Do not use pointed bullets in those rifles which have tubular magazines

38 Gr. (w/Gas Check) Bullet #225107 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.0	1505	5.0	2100
Green Dot	3.5	1635	5.5	2230
Unique	4.0	1685	6.0	2260
700X	3.0	1555	5.0	2165
PB	3.5	1615	5.5	2175
SR7625	4.0	1735	6.5	2375
230	3.0	1575	5.0	2165

45 Gr. (w/Gas Check) Bullet #225438 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	2.8	1345	4.8	1885
Green Dot	3.3	1460	5.3	2005
Unique	3.8	1500	5.8	2035
700X	2.8	1360	4.8	1910
PB	3.3	1420	5.3	1930
SR7625	3.8	1550	6.2	2135
230	2.8	1385	4.8	1910

50 Gr. (w/Gas Check) Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	2.8	1295	4.7	1805
Green Dot	3.3	1410	5.2	1915
Unique	3.7	1450	5.7	1960
700X	2.8	1310	4.7	1805
PB	3.3	1365	5.2	1845
SR7625	3.8	1480	6.0	2005
230	2.8	1305	4.7	1825

.222 REMINGTON (5.7 X 43 MM)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .224″
Maximum Case Length .....1.700″
Trim-to Length .....1.690″
Maximum Overall Length (with Bullet) .....2.130″
Primer Size .....Small Rifle
Lyman Shell Holder Number 26

TEST COMPONENTS

Cases .....Remington
Primers .....Remington 7½
Cast Bullet Used .....*225107 - 38 Gr.
*Gas Check *225438 - 45 Gr.
*225415 - 50 Gr.
*225462 - 58 Gr.

TEST (Pressure and Velocity) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....26″
Twist .....1-14″
Groove Diameter ..... .224″

NOTE: Very uniform ballistics and good accuracy was obtained with all of the bullet weights tested. The 38 grain cast bullet, however, did not group quite as well as the other bullet weights. All loads were tested with the Remington 7½ primer (designed specifically for cartridges of this type).

38 Gr. (w/Gas Check)
Bullet #225107 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	5.0	1915	24,000	6.9	2375	39,900
PB	5.5	1915	23,400	7.7	2392	40,700
SR7625	6.0	2070	27,000	8.0	2409	40,700
SR4756	6.5	2044	21,000	9.0	2570	39,900
Red Dot	5.5	2057	25,800	7.5	2481	39,900
Green Dot	6.0	2118	27,000	8.2	2544	40,700
Unique	6.0	2132	21,600	7.5	2481	29,400
630	8.0	1988	18,600	10.5	2421	25,800

45 Gr. (w/Gas Check)
Bullet #225438 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	5.0	1872	27,600	6.6	2178	39,900
PB	5.5	1845	27,000	7.2	2141	39,000
SR7625	6.0	1915	30,000	7.2	2169	39,900
SR4756	6.3	1988	23,400	8.7	2380	36,400
Red Dot	5.3	1934	27,000	7.4	2309	40,700
Green Dot	5.5	1908	27,000	7.8	2331	40,700
Unique	6.0	2053	24,600	8.0	2444	36,000
Herco	6.5	2044	27,000	9.1	2481	40,300
630	8.0	1956	20,400	11.0	2403	30,000

50 Gr. (w/Gas Check)
Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	4.7	1709	27,000	6.4	2053	39,900
PB	5.2	1718	25,800	7.0	2024	39,400
SR7625	5.7	1785	24,000	7.0	2016	35,500
SR4756	6.0	1769	21,600	8.7	2267	40,300
Red Dot	5.1	1785	25,200	7.4	2217	39,000
Green Dot	5.3	1779	26,400	7.7	2232	40,700
Unique	6.0	1972	25,800	8.0	2358	36,000
Herco	6.5	1956	27,000	8.8	2336	40,700
630	8.0	1919	22,200	11.0	2364	32,000

58 Gr. (w/Gas Check)
Bullet #225462 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	4.3	1510	24,600	6.2	1855	39,400
PB	4.8	1510	25,800	6.5	1828	40,700
SR7625	5.1	1565	27,600	6.5	1815	39,900
SR4756	6.0	1666	26,400	8.1	2044	40,300
Red Dot	4.7	1590	27,000	7.0	2004	40,300
Green Dot	5.0	1595	27,000	7.4	1980	40,700
Unique	5.7	1795	25,800	8.0	2222	39,900
Herco	6.2	1808	27,000	8.6	2227	39,400
630	8.0	1851	24,000	11.0	2298	36,000

.223 REMINGTON

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .224″
Maximum Case Length ..... 1.760″
Trim-to Length ..... 1.750″
Maximum Overall Length (With Bullet) ..... 2.260″
Primer Size .....Small Rifle
Lyman Shell Holder Number 26

TEST COMPONENTS

Cases .....Federal
Primers .....Remington 7½
Cast Bullet Used .....*225107 - 38 Gr. - 1.992″
*Gas Check *225438 - 45 Gr. - 2.034″
*225415 - 50 Gr. - 2.060″
*225462 - 58 Gr. - 2.090″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....24″
Twist .....1-12″
Groove Diameter ..... .224″

38 Gr. (w/Gas Check)
Bullet #225107 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	6.0	2060	23,400	9.5	2590	40,700
Green Dot	6.5	2075	22,200	9.5	2560	36,000
Unique	7.0	2070	19,200	10.0	2690	33,500
700X	6.0	2065	24,600	8.5	2460	39,900
PB	6.5	2005	21,600	9.0	2400	36,400
SR7625	7.0	2060	22,200	9.5	2460	37,700
230	6.0	2060	22,800	9.0	2540	39,900
630	10.0	2195	19,200	12.5	2530	24,600

45 Gr. (w/Gas Check)
Bullet #225438 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	5.7	1870	22,800	9.2	2370	40,700
Green Dot	6.3	1905	22,800	9.3	2335	37,700
Unique	7.0	1945	21,000	10.0	2530	36,400
700X	5.8	1875	24,000	8.2	2245	41,100
PB	6.5	1860	23,400	9.2	2250	40,300
SR7625	6.8	1895	24,600	9.3	2260	40,300
230	5.8	1885	23,400	8.5	2275	40,300
630	10.0	2120	20,400	12.5	2430	27,000

50 Gr. (w/Gas Check)
Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	5.6	1795	23,400	9.0	2280	40,700
Green Dot	6.2	1855	23,400	9.2	2270	39,000
Unique	6.8	1900	20,400	9.5	2300	35,000
700X	5.6	1790	23,400	7.7	2080	39,400
PB	6.3	1775	24,000	8.7	2120	39,400
SR7625	6.6	1820	24,000	8.8	2120	39,900
230	5.6	1795	22,800	8.2	2190	40,300
630	10.0	2080	21,000	12.5	2375	28,200

58 Gr. (w/Gas Check)
Bullet #225462 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	5.4	1675	22,800	8.6	2100	40,700
Green Dot	6.0	1735	23,400	8.8	2110	38,100
Unique	6.7	1805	22,000	9.0	2110	30,000
700X	5.4	1680	25,200	7.5	1970	39,000
PB	6.1	1675	24,000	8.5	1980	40,300
SR7625	6.4	1715	25,800	8.3	1950	39,400
230	5.4	1665	24,000	7.9	2030	39,900
630	10.0	2020	22,200	12.5	2285	29,400

.222 REMINGTON MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .224″
Maximum Case Length ..... 1.850″
Trim-to Length ..... 1.840″
Maximum Overall Length (With Bullet) ..... 2.280″
Primer Size .....Small Rifle
Lyman Shell Holder Number 26

TEST COMPONENTS

Cases .....Remington-Peters
Primers .....Remington 7½
Cast Bullet Used .....*225107 - 38 Grs. - 2.105″
*Gas Check *225438 - 45 Grs. - 2.132″
*225415 - 50 Grs. - 2.150″
*225462 - 58 Grs. - 2.075″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Remington Model 722
Barrel Length .....24″
Twist .....1-14″
Groove Diameter ..... .224″

38 Gr. (w/Gas Check) Bullet #225107 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.0	2070	9.5	2610
Green Dot	6.5	2110	9.5	2585
Unique	7.0	2125	10.0	2755
700X	6.0	2105	8.5	2510
PB	6.5	2050	9.5	2525
SR7625	7.0	2130	9.5	2510
230	6.0	2100	9.0	2580
630	10.0	2280	12.5	2620

45 Gr. (w/Gas Check) Bullet #225438 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	5.8	1895	9.3	2415
Green Dot	6.4	1945	9.4	2390
Unique	7.0	1975	10.0	2545
700X	5.8	1885	8.2	2265
PB	6.5	1890	9.3	2285
SR7625	6.9	1940	9.3	2285
230	5.8	1905	8.8	2360
630	10.0	2150	12.5	2430

50 Gr. (w/Gas Check) Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	5.6	1800	9.1	2335
Green Dot	6.2	1870	9.2	2295
Unique	6.8	1925	9.7	2325
700X	5.6	1800	8.0	2175
PB	6.3	1800	9.0	2190
SR7625	6.7	1855	9.1	2205
230	5.6	1815	8.6	2270
630	9.8	1940	12.3	2365

58 Gr. (w/Gas Check) Bullet #225462 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	5.4	1675	8.9	2175
Green Dot	6.0	1750	9.0	2165
Unique	6.6	1800	9.5	2195
700X	5.4	1660	7.8	2010
PB	6.1	1675	8.8	2045
SR7625	6.5	1720	8.9	2030
230	5.4	1665	8.4	2115
630	9.8	1910	12.3	2310

.225 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .224″
Maximum Case Length ..... 1.930″
Trim-to Length ..... 1.920″
Maximum Overall Length (With Bullet) ..... 2.500″
Primer Size .....Large Rifle
Lyman Shell Holder Number 5

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester/Western 8½ - 120
Cast Bullet Used .....*225107 - 38 Gr. - 2.190
*Gas Check *225438 - 45 Gr. - 2.210
*225415 - 50 Gr. - 2.235
*225462 - 58 Gr. - 2.150

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Winchester Model 70
Barrel Length .....22″
Twist .....1-14″
Groove Diameter ..... .224″

NOTE: Velocity readings in this caliber tend to be very erratic from one gun to the next. Pressures tend to jump around quite a bit. Data taken in one gun will not necessarily be uniform with results in another gun.

38 Gr. (w/Gas Check) Bullet #225107 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.5	2090	9.5	2600
Green Dot	7.0	2145	10.0	2620
Unique	7.5	2165	10.5	2640
700X	6.5	2130	9.5	2600
PB	7.0	2065	10.0	2540
SR7625	7.5	2145	10.5	2600
230	6.5	2100	9.5	2580
630	10.0	2085	13.0	2460

45 Gr. (w/Gas Check) Bullet #225438 (#2 alloy)

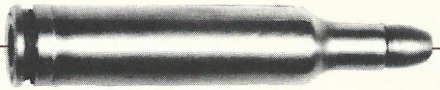
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.5	1875	9.5	2345
Green Dot	7.0	1975	10.0	2410
Unique	7.5	1990	10.5	2410
700X	6.5	1910	9.5	2360
PB	7.0	1890	10.0	2325
SR7625	7.5	1920	10.5	2355
230	6.5	1920	9.5	2350
630	10.0	1935	13.0	2295

50 Gr. (w/Gas Check) Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.0	1770	9.0	2235
Green Dot	6.5	1845	9.5	2280
Unique	7.0	1880	10.0	2315
700X	6.0	1775	9.0	2185
PB	6.5	1760	9.5	2170
SR7625	7.0	1825	10.0	2195
230	6.0	1770	9.0	2190
630	9.5	1825	12.5	2195

58 Gr. (w/Gas Check) Bullet #225462 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	5.5	1610	8.5	1965
Green Dot	6.0	1660	9.0	2060
Unique	6.5	1695	9.5	2045
700X	5.5	1590	8.5	1995
PB	6.0	1565	9.0	1970
SR7625	6.5	1640	9.5	2025
230	5.5	1585	8.5	1995
630	9.5	1820	12.5	2120



.224 WEATHERBY MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .224″
Maximum Case Length ..... 1.925″
Trim-to Length ..... 1.915″
Maximum Overall Length (with Bullet) ..... 2.312″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 3

TEST COMPONENTS

Cases ..... Weatherby
Primers ..... Remington 9½
Cast Bullet Used ..... *225415 - 50 Gr.
*Gas Check *225462 - 58 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Weatherby Varmint Master
Barrel Length ..... 26″
Twist ..... 1-14″
Groove Diameter ..... .224″

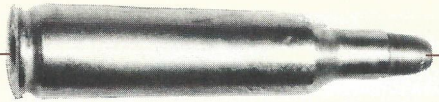
NOTE: In this case the use of a magnum type primer will result in very high and dangerous pressures. Use only standard large rifle primers for this cartridge.

50 Gr. (w/Gas Check)
Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	6.0	1818	7.0	2008
2400	11.0	1964	13.0	2314

58 Gr. (w/Gas Check)
Bullet #225462 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	6.0	1727	8.0	2074
IMR4227	13.0	2092	15.0	2386



.22/250

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .224″
Maximum Case Length ..... 1.912″
Trim-to Length ..... 1.902″
Maximum Overall Length (with Bullet) ..... 2.350″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases ..... Winchester
Primers ..... Winchester 8½ - 120
Cast Bullet Used ..... *225438 - 45 Gr.
*Gas Check *225415 - 50 Gr.
*225462 - 58 Gr.

TEST (Pressure and Velocity) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 26″
Twist ..... 1-14″
Groove Diameter ..... .224″

NOTE: The 50 and 58 grain cast bullets gave a bit better accuracy than the lighter cast bullets.
Very uniform ballistics were obtained with the 58 grain cast bullet. Accuracy loads with this bullet (No. 225462) showed velocity spreads (in 10 shot strings) as little as 10 F.P.S.
Due to the wide variations in "custom" chambers, maximum loads in "custom" guns should be approached with extreme caution.

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	7.0	2021	17,100	9.0	2354	32,000
PB	7.5	1997	17,100	9.5	2277	30,000
SR7625	7.5	1982	15,400	10.0	2362	35,000
SR4756	8.0	1936	15,400	11.0	2445	31,000
Red Dot	7.2	2079	17,100	9.5	2404	32,000
Green Dot	7.5	2050	15,400	10.0	2413	30,000
630	9.0	1840	NR	11.0	2090	15,400

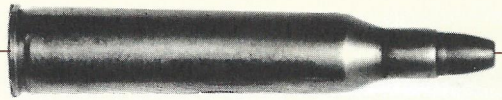
45 Gr. (w/Gas Check)
Bullet #225438 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	7.0	1850	18,000	9.0	2268	33,500
PB	7.5	1920	18,000	9.5	2188	31,000
SR7625	8.0	1981	20,400	10.0	2237	36,900
SR4756	8.0	1915	18,000	11.0	2308	32,000
Red Dot	7.2	1981	22,800	9.5	2323	35,000
Green Dot	7.5	1992	21,000	10.0	2356	34,500
630	9.0	1825	15,400	11.0	2086	18,000

50 Gr. (w/Gas Check)
Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	7.5	1937	29,400	9.0	2143	36,900
PB	8.0	1880	27,000	9.5	2088	36,400
SR7625	8.5	1955	30,500	10.0	2157	38,600
SR4756	8.5	1935	18,600	10.5	2207	35,500
Red Dot	7.0	1828	21,000	9.5	2184	36,400
Green Dot	7.0	1828	21,000	10.0	2236	36,900
630	9.0	1837	17,100	11.5	2143	21,000

58 Gr. (w/Gas Check)
Bullet #225462 (#2 alloy)



.220 SWIFT

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .224″
Maximum Case Length ..... 2.205″
Trim-to Length ..... 2.195″
Maximum Overall Length (With Bullet) ..... 2.680″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 5

TEST COMPONENTS

Cases ..... Winchester
Primers ..... Winchester 8½ - 120
Cast Bullet Used ..... *225438 - 45 Gr. - 2.425″
*Gas Check *225415 - 50 Gr. - 2.505″
*225462 - 58 Gr. - 2.425″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Universal Receiver Velocity BBL
Barrel Length ..... 24″
Twist ..... 1-14″
Groove Diameter ..... .224″

45 Gr. (w/Gas Check) Bullet #225438 (#2 alloy)

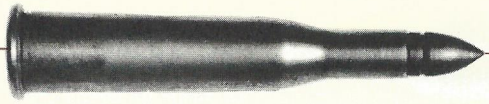
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.5	1795	10.0	2350
Green Dot	7.0	1800	10.5	2365
Unique	7.5	1835	11.0	2390
700X	6.5	1795	10.0	2335
PB	7.0	1750	10.5	2290
SR7625	7.5	1800	11.0	2345
230	6.5	1790	10.0	2350

50 Gr. (w/Gas Check) Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.5	1730	10.0	2270
Green Dot	7.0	1800	10.5	2305
Unique	7.5	1805	11.0	2320
700X	6.5	1710	10.0	2275
PB	7.0	1680	10.5	2210
SR7625	7.5	1765	11.0	2280
230	6.5	1750	10.0	2275

58 Gr. (w/Gas Check) Bullet #225462 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.0	1605	9.5	2035
Green Dot	6.5	1660	10.0	2130
Unique	7.0	1705	10.5	2165
700X	6.0	1615	9.5	2040
PB	6.5	1610	10.0	2060
SR7625	7.0	1635	10.5	2115
230	6.0	1615	9.5	2030



.22 SAVAGE HI-POWER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .228″
Maximum Case Length ..... 2.050″
Trim-to Length ..... 2.040″
Maximum Overall Length (With Bullet) ..... 2.510″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 6

TEST COMPONENTS

Cases ..... Winchester
Primers ..... Winchester 120
Cast Bullet Used ..... *228365 - 60 Gr.
*Gas Check 22835 - 78 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Savage 99
Barrel Length ..... 20″
Twist ..... 1-12″
Groove Diameter ..... .229″

NOTE: Variations in groove diameters are sometimes encountered in rifles chambered for this cartridge. Most barrels have a groove diameter of .228 while a small percentage are found with a larger groove of .229. For oversize barrels, we recommend the use of cast lead bullets sized to groove diameter.

60 Gr. (w/Gas Check)
Bullet #228365 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	6.5	1754	7.7	1908
2400	11.0	1811	13.0	2074
IMR4227	12.0	1893	14.0	2145

78 Gr.
Bullet #22835 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	6.0	1501	7.0	1625
2400	9.0	1562	11.5	1730
IMR4227	10.0	1590	12.5	1792

.243 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .243″
Maximum Case Length ..... 2.045″
Trim-to Length ..... 2.035″
Maximum Overall Length (with Bullet) ..... 2.710″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases ..... Remington
Primers ..... Remington 9½
Case Bullet Used ..... *245496 - 85 Gr.
*Gas Check *245497 - 95 Gr.
*245498 - 100 Gr.

TEST (Pressure and Velocity) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 26″
Twist ..... 1-10″
Groove Diameter ..... .243″

NOTE: If your .243 rifle is imported, we recommend that you carefully check its groove diameter. We have encountered rifles with groove diameters as small as .239. When fired in these tight groove rifles, factory loaded .243 cartridges blew primers and even our starting loads proved too hot. We, therefore, advise that you consider any rifle with a groove diameter of under .241 as dangerous.

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	8.5	1684	30,500	10.5	1904	39,000
PB	9.0	1653	29,400	11.0	1836	36,400
SR7625	9.5	1703	30,500	11.5	1909	39,400
SR4756	11.0	1846	31,500	13.0	2013	38,600
Red Dot	10.0	1845	33,000	12.0	2032	40,300

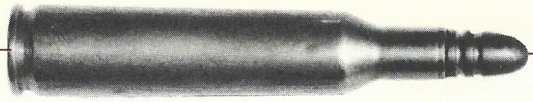
85 Gr. (w/Gas Check)
Bullet #245496 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	7.5	1513	26,400	10.0	1762	37,300
PB	8.0	1477	23,400	10.5	1815	39,900
SR7625	8.5	1521	25,800	11.0	1768	36,400
SR4756	9.5	1586	26,400	12.5	1869	36,400
Red Dot	8.5	1611	27,000	11.5	1934	39,400

95 Gr. (w/Gas Check)
Bullet #245497 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	7.0	1386	22,200	9.5	1653	34,500
PB	8.0	1424	24,600	10.0	1611	32,000
SR7625	8.5	1463	27,000	10.5	1652	35,500
SR4756	10.0	1550	26,400	12.0	1790	35,000
Red Dot	8.0	1482	22,800	10.0	1699	33,000

100 Gr. (w/Gas Check)
Bullet #245498 (#2 alloy)



6MM REMINGTON
244 REMINGTON

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .243″
Maximum Case Length ..... 2.233″
Trim-to Length ..... 2.225″
Maximum Overall Length (with Bullet) ..... 2.825″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases ..... Remington
Primers ..... Remington 9½
Cast Bullet Used ..... *245496 - 85 Gr.
*Gas Check *245497 - 95 Gr. *245498 - 100 Gr.

TEST (Pressure and Velocity) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 26″
Twist ..... 1-9″
Groove Diameter ..... .243″

NOTE: The only difference between the 6 M/M Remington and the .244 Remington cartridge is in the factory bullet weights which are loaded into these two cases. The cases themselves are identical except for the headstamps.
Normally, .244 rifles have a 1-12″ twist and the cartridge is factory loaded with 75 and 90 grain bullets to accommodate this rifling. The 6 M/M Remington cartridge is factory loaded with a 100 grain bullet to better accommodate the 1-9″ twist of the 6 M/M rifles.
While our listed data is interchangeable for both of these cartridges, we recommend that bullets under 90 grains be used in the .244 Remington. Bullets over 75 grains are suggested for the 6 M/M Remington.

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	8.5	1635	29,400	10.7	1879	40,700
PB	9.0	1642	27,600	11.0	1829	38,600
SR7625	9.0	1628	29,400	11.0	1818	38,600
SR4756	10.0	1725	29,400	12.5	1979	40,700
Red Dot	9.0	1726	30,500	11.5	1973	40,700
Green Dot	9.0	1703	27,600	11.5	1947	39,900

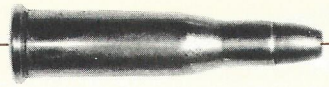
85 Gr. (w/Gas Check)
Bullet #245496 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	8.0	1551	24,600	10.2	1776	39,000
PB	8.5	1540	21,000	10.6	1729	39,000
SR7625	8.5	1523	25,200	10.6	1739	39,400
SR4756	9.5	1627	28,800	12.0	1845	38,600
Red Dot	8.5	1582	28,800	11.0	1831	40,300
Green Dot	8.5	1581	27,000	11.0	1826	38,600

95 Gr. (w/Gas Check)
Bullet #245497 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	7.6	1456	25,200	9.9	1699	38,100
PB	8.2	1438	25,800	10.3	1630	37,300
SR7625	8.2	1448	24,600	10.3	1639	36,900
SR4756	9.0	1498	27,600	11.7	1751	37,700
Red Dot	8.1	1491	25,800	10.6	1756	38,600
Green Dot	8.2	1489	24,000	10.7	1732	36,400

100 Gr. (w/Gas Check)
Bullet #245498 (#2 alloy)



25/20 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .257″
Maximum Case Length ..... 1.330″
Trim-to Length ..... 1.312″
Maximum Overall Length (With Bullet) ..... 1.592″
Primer Size ..... Small Rifle
Lyman Shell Holder Number 10

TEST COMPONENTS

Cases ..... Winchester/Western
Primers ..... Winchester 6½ - 116
Cast Bullet Used ..... *257420 - 69 Gr. - 1.560″
*Gas Check *257312 - 90 Gr. - 1.555″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Winchester 92
Barrel Length ..... 24″
Twist ..... 1-14″
Groove Diameter ..... .256″

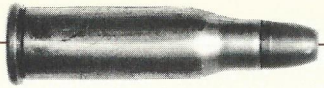
NOTE: Use only round, or flat nose bullets, in those rifles which have tubular magazines. Caution: these loads are not intended for rifles which were designed for black powder cartridges.

69 Gr. (w/Gas Check)
Bullet #257420 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.5	1320	4.5	1560
Green Dot	4.0	1400	5.0	1665
Unique	4.5	1455	6.0	1805
700X	3.5	1345	4.5	1580
PB	4.0	1360	5.0	1605
SR7625	4.5	1480	5.5	1700
230	3.5	1330	4.5	1590

90 Gr. (w/Gas Check)
Bullet #257312 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.2	1125	4.2	1355
Green Dot	3.7	1220	4.7	1425
Unique	4.2	1270	5.5	1555
700X	3.2	1160	4.0	1320
PB	3.6	1175	4.5	1345
SR7625	3.9	1230	4.7	1390
230	3.2	1125	4.2	1360



.256 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .257″
Maximum Case Length ..... 1.281″
Trim-to Length ..... 1.275″
Maximum Overall Length (With Bullet) ..... 1.590″
Primer Size ..... Small Rifle
Lyman Shell Holder Number 1

TEST COMPONENTS

Cases ..... Winchester
Primers ..... Remington 6½
Cast Bullet Used ..... *257420 - 69 Gr.
*Gas Check *257312 - 90 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Marlin 62
Barrel Length ..... 24″
Twist ..... 1-14″
Groove Diameter ..... .257″

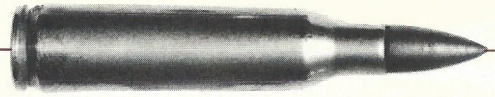
NOTE: Many of the rifles chambered for this cartridge have slightly oversize chambers which create a problem for the reloader. These chambers cause excessive case stretching which makes it impossible to resize brass after two or three firings. The small case capacity of the cartridge limits suitable reloading powders to a very few. Ballistics and accuracy, however, are good.

69 Gr. (w/Gas Check)
Bullet #257420 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	5.0	1669	6.0	1883
2400	9.0	1745	11.0	2105
IMR4227	10.0	1779	12.0	2096

90 Gr. (w/Gas Check)
Bullet #257312 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	5.0	1492	6.0	1697
2400	10.0	1808	12.0	2123
IMR4227	11.0	1824	13.0	2123



.250 SAVAGE (250/3000 SAVAGE)

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .257″
Maximum Case Length ..... 1.912″
Trim-to Length ..... 1.902″
Maximum Overall Length (With Bullet) ..... 2.515″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Norma
Primers .....Remington 9½
Cast Bullet Used .....*257463 - 75 Gr. - 2.225″
*Gas Check *257312 - 90 Gr. - 2.205″
*257418 - 100 Gr. - 2.417″
*257325 - 117 Gr. - 2.375″

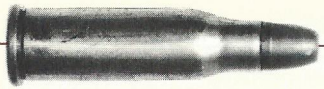
TEST (Velocity) SPECIFICATIONS

Firearm used .....Savage 99
Barrel Length .....20″
Twist .....1-14″
Groove Diameter ..... .257″

NOTE: A good many rifles which are chambered for this cartridge have 1-10″ twist barrels. In these rifles, bullets less than 75 gr. will seldom give accuracy.

75 Gr. (w/Gas Check) Bullet #257463 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1585	10.0	2000
Green Dot	7.5	1615	10.5	2015
Unique	8.0	1625	11.0	2030
700X	7.0	1595	10.0	2015
PB	8.0	1600	10.5	1945
SR7625	8.5	1625	11.0	1980
230	7.0	1590	10.0	2015



.256 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .257″
Maximum Case Length ..... 1.281″
Trim-to Length ..... 1.275″
Maximum Overall Length (With Bullet) ..... 1.590″
Primer Size ..... Small Rifle
Lyman Shell Holder Number 1

TEST COMPONENTS

Cases ..... Winchester
Primers ..... Remington 6½
Cast Bullet Used ..... *257420 - 69 Gr.
*Gas Check *257312 - 90 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Marlin 62
Barrel Length ..... 24″
Twist ..... 1-14″
Groove Diameter ..... .257″

NOTE: Many of the rifles chambered for this cartridge have slightly oversize chambers which create a problem for the reloader. These chambers cause excessive case stretching which makes it impossible to resize brass after two or three firings. The small case capacity of the cartridge limits suitable reloading powders to a very few. Ballistics and accuracy, however, are good.

69 Gr. (w/Gas Check)
Bullet #257420 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	5.0	1669	6.0	1883
2400	9.0	1745	11.0	2105
IMR4227	10.0	1779	12.0	2096

90 Gr. (w/Gas Check)
Bullet #257312 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	5.0	1492	6.0	1697
2400	10.0	1808	12.0	2123
IMR4227	11.0	1824	13.0	2123

.250 SAVAGE (250/3000 SAVAGE)

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .257″
Maximum Case Length ..... 1.912″
Trim-to Length ..... 1.902″
Maximum Overall Length (With Bullet) ..... 2.515″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Norma
Primers .....Remington 9½
Cast Bullet Used .....*257463 - 75 Gr. - 2.225″
*Gas Check *257312 - 90 Gr. - 2.205″
*257418 - 100 Gr. - 2.417″
*257325 - 117 Gr. - 2.375″

TEST (Velocity) SPECIFICATIONS

Firearm used .....Savage 99
Barrel Length .....20″
Twist .....1-14″
Groove Diameter ..... .257″

NOTE: A good many rifles which are chambered for this cartridge have 1-10″ twist barrels. In these rifles, bullets less than 75 gr. will seldom give accuracy.

75 Gr. (w/Gas Check) Bullet #257463 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1585	10.0	2000
Green Dot	7.5	1615	10.5	2015
Unique	8.0	1625	11.0	2030
700X	7.0	1595	10.0	2015
PB	8.0	1600	10.5	1945
SR7625	8.5	1625	11.0	1980
230	7.0	1590	10.0	2015

90 Gr. (w/Gas Check)
Bullet #257312 (#2 alloy)

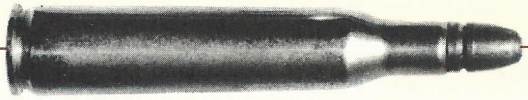
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1510	9.5	1800
Green Dot	7.0	1495	10.0	1835
Unique	7.5	1525	10.5	1865
700X	6.5	1460	9.0	1750
PB	7.5	1500	10.0	1770
SR7625	8.0	1550	10.5	1815
230	6.5	1460	9.5	1810

100 Gr. (w/Gas Check)
Bullet #257418 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.0	1335	9.0	1665
Green Dot	6.5	1375	9.5	1720
Unique	7.0	1420	10.0	1745
700X	6.0	1345	8.5	1625
PB	7.0	1375	9.5	1645
SR7625	7.5	1435	10.0	1680
230	6.0	1340	9.0	1685

117 Gr. (w/Gas Check)
Bullet #257325 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.0	1255	8.5	1515
Green Dot	6.0	1230	9.0	1560
Unique	6.5	1270	9.5	1590
700X	5.5	1195	8.0	1475
PB	6.5	1235	9.0	1495
SR7625	7.0	1280	9.5	1530
230	6.0	1260	8.5	1530



.257 ROBERTS

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .257″
Maximum Case Length ..... 2.233″
Trim-to-Length ..... 2.223″
Maximum Overall Length (With Bullet) ..... 2.775″
Primer Size ..... Large Rifle
Lyman Shell Holder Number ..... 8 or 2

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 9½
Cast Bullet Used ..... *257463 - 75 Gr. 2.555″
*Gas Check *257312 - 90 Gr. 2.620″
*257418 - 100 Gr. 2.760″
*257325 - 117 Gr. 2.710″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Ruger M77
Barrel Length ..... 24″
Twist ..... 1-12″
Groove Diameter ..... .257″

NOTE: Most commercial rifles for this cartridge used a short magazine which limits overall cartridge length to 2.75″. Prevalent also was the use of a long chamber throat which gives best accuracy results when the bullet is seated just short of touching the rifling. This combination of a short magazine and long throat does not allow for best performance.

Cartridge brass varies in the contour of the extractor cut and hence one shell holder will not always fit all cases. The use of a Lyman No. 8 shell holder is suggested wherever possible. A No. 2 shell holder can be used whenever a No. 8 proves unsatisfactory.

75 Gr. (w/Gas Check) Bullet #257463 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1525	12.0	2115
Green Dot	8.0	1605	13.0	2170
Unique	9.0	1680	14.0	2230
700X	7.0	1545	12.0	2125
PB	8.0	1555	13.0	2090
SR7625	9.0	1650	13.5	2135
230	7.0	1535	12.0	2130
630	12.0	1770	18.0	2300

90 Gr. (w/Gas Check) Bullet #257312 (#2 alloy)

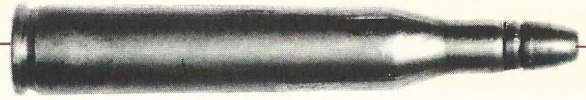
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1430	12.0	1960
Green Dot	8.0	1515	12.5	1985
Unique	9.0	1590	13.5	2040
700X	7.0	1435	11.5	1925
PB	8.0	1450	12.5	1905
SR7625	9.0	1535	13.0	1940
230	7.0	1450	11.5	1930
630	12.0	1705	18.0	2190

100 Gr. (w/Gas Check) Bullet #257418 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1365	11.5	1840
Green Dot	8.0	1445	12.0	1870
Unique	9.0	1510	13.0	1925
700X	7.0	1380	11.0	1820
PB	8.0	1395	12.0	1800
SR7625	9.0	1470	12.0	1800
230	7.0	1390	11.0	1825
630	12.0	1635	18.0	2090

117 Gr. (w/Gas Check) Bullet #257325 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.5	1240	11.0	1700
Green Dot	7.5	1325	11.5	1730
Unique	8.5	1400	12.5	1785
700X	6.5	1245	10.5	1665
PB	7.5	1255	11.5	1655
SR7625	8.5	1340	11.5	1645
230	6.5	1245	10.5	1670
630	11.0	1500	17.0	1970



25/06 REMINGTON

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .257″
Maximum Case Length ..... 2.494″
Trim-to Length ..... 2.484″
Maximum Overall Length (With Bullet) ..... 3.250″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases ..... Remington
Primers ..... Winchester 8½
Cast Bullet Used ..... *257420 - 69 Gr.
*Gas Check *257463 - 75 Gr.
*257312 - 90 Gr.
*257418 - 100 Gr.

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 26″
Twist ..... 1-10″
Groove Diameter ..... .257″

NOTE: accuracy with the 69 and 75 grain cast bullets was only fair in this caliber; all other cast bullets tested shot very well.
In some instances the starting loads did not rupture the cases and hence no pressure recording was possible. These loads are marked N.R.
In custom chambered 25/06 rifles, approach maximum loads with caution as there is a great deal of variation in these custom chambers.
We have listed only those powders which produced satisfactory results. However, due to the wide variation in components and the resulting ballistic performance it is wise to be extra cautious when working with loads in this caliber. If any signs of pressures are encountered with starting loads, try another type powder.

69 Gr. (w/Gas Check)
Bullet #257420 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1989	NR	13.0	2269	38,100
PB	11.0	1967	NR	14.5	2304	39,400
SR7625	11.0	1978	NR	15.0	2322	41,600
SR4756	12.0	2008	NR	16.0	2389	40,700
Red Dot	11.0	2087	NR	14.0	2379	39,400
Green Dot	12.0	2149	NR	15.5	2400	41,600

75 Gr. (w/Gas Check)
Bullet #257463 (#2 alloy)

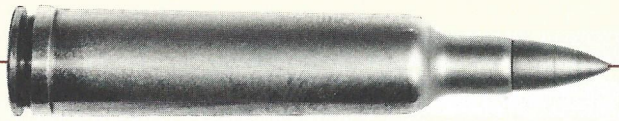
Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1898	NR	13.0	2192	36,000
PB	11.0	1907	NR	14.0	2174	37,700
SR7625	11.0	1867	NR	14.5	2220	41,600
SR4756	12.0	1937	NR	15.5	2265	36,400
Red Dot	11.0	1997	NR	12.5	2171	33,000
Green Dot	12.0	2080	28,800	13.5	2226	36,900

90 Gr. (w/Gas Check)
Bullet #257312 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1785	27,000	12.5	2006	38,600
PB	11.0	1784	NR	13.5	1978	38,600
SR7625	11.0	1747	NR	14.0	2011	41,100
SR4756	12.0	1816	NR	15.0	2040	35,500
Red Dot	11.0	1856	31,000	12.5	1970	35,500
Green Dot	12.0	1906	33,500	13.0	1992	36,000
Unique	13.0	2074	32,500	15.0	2224	39,400
630	12.0	1723	NR	16.0	2047	NR

100 Gr. (w/Gas Check)
Bullet #257418 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1695	NR	12.0	1876	36,000
PB	11.0	1709	NR	13.0	1865	35,500
SR7625	11.0	1689	25,200	13.5	1899	37,300
SR4756	12.0	1730	NR	15.0	1998	37,300
Red Dot	10.5	1741	25,200	12.5	1904	35,000
Green Dot	11.5	1806	28,200	13.0	1926	36,000



.257 WEATHERBY MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .257″
Maximum Case Length ..... 2.550″
Trim-to Length ..... 2.540″
Maximum Overall Length (With Bullet) ..... 3.250″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Weatherby
Primers ..... Remington 9½
Cast Bullet Used ..... *257312 - 90 Gr.
*Gas Check *257418 - 100 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Weatherby Mark V
Barrel Length ..... 26″
Twist ..... 1-12″
Groove Diameter ..... .257″

NOTE: The data listed for this cartridge was obtained in a Weatherby rifle and is intended for Weatherby rifles only. The free-boring constructed into these firearms allow higher velocities at safe working pressures. For custom rifles which are not freebored, maximum loads should be reduced a full 5%. Even then, they should be approached with caution.

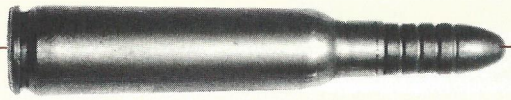
Do not use the magnum primers with cast bullet data. Cast bullet data was obtained with Remington 9½ primers.

90 Gr. (w/Gas Check)
Bullet #257312 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	13.0	1915	19.0	2386
2400	19.0	1984	24.0	2309

100 Gr. (w/Gas Check)
Bullet #257418 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	12.0	1763	16.0	2079
2400	18.0	1808	23.0	2145



6.5 JAPANESE (6.5 X 50 MM ARISAKA)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .264″ to .266″
Maximum Case Length ..... 1.988″
Trim-to Length ..... 1.978″
Maximum Overall Length (With Bullet) ..... 2.940″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 5

TEST COMPONENTS

Cases ..... Norma
Primers ..... Remington 9½
Cast Bullet Used ..... *266305 - 103 Gr.
*Gas Check 266324 - 119 Gr.
*266455 - 129 Gr.
*266469 - 143 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Japanese Service Carbine
Barrel Length ..... 19″
Twist ..... 1-9″
Groove Diameter ..... .267″

NOTE: Norma brass was used exclusively for our testing of this cartridge. Bullets weighing 119 grains or more gave the best accuracy. A wide variation in groove diameter is common with these military rifles and we recommend that you slug your bore before reloading.

103 Gr. (w/Gas Check) Bullet #266305 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	16.5	1824	19.0	2044
IMR4227	21.0	2028	23.0	2207
IMR4198	24.0	2114	27.0	2352
IMR4895	28.0	2016	33.0	2375

119 Gr. Bullet #266324 (#2 alloy)

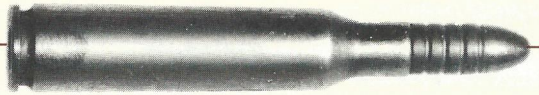
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	15.0	1615	18.0	1868
IMR4227	19.5	1893	22.0	2083
IMR4198	22.0	1919	24.0	2057
IMR4895	28.0	1976	31.0	2092

129 Gr. (w/Gas Check) Bullet #266455 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	14.0	1488	19.0	1960
IMR4227	19.0	1818	21.0	1988
IMR4198	23.0	1980	27.0	2145
IMR4895	27.0	1996	31.0	2242

143 Gr. (w/Gas Check) Bullet #266469 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	14.0	1515	18.0	1845
IMR4227	18.0	1683	21.0	1956
IMR4198	22.0	1893	26.0	2159
IMR4895	26.0	1858	32.0	2272



6.5 ITALIAN
(6.5 X 52 MM MANN. CARCANO)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .264″ to .266″
Maximum Case Length .....2.060″
Trim-to Length .....2.055″
Maximum Overall Length (With Bullet) .....2.900″
Primer Size .....Large Rifle
Lyman Shell Holder Number 28

TEST COMPONENTS

Cases .....Norma
Primers .....Remington 9½
Cast Bullet Used ..... 266324 - 119 Gr.
*Gas Check *266455 - 129 Gr.
*266469 - 143 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Italian Service Carbine
Barrel Length .....21″
Twist .....Gain Twist
Groove Diameter ..... .267″

NOTE: Due to the wide variations in groove diameters which exist in these surplus military rifles, we suggest that you proceed with caution. Slug your bore to determine the correct bullet diameter for your rifle. See the reference section for information on slugging your bore. If your groove diameter is larger than .264″, you could experience gas blow-by (gas from breech due to low pressure) when using the listed starting loads with the standard bullet size. We suggest that you wear shooting glasses when working out loads and that you consider the use of cast bullets sized to the exact groove diameter of your particular rifle.

119 Gr.
Bullet #266324 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	9.0	1445	11.0	1615
2400	21.0	1960	23.0	2114

129 Gr. (w/Gas Check)
Bullet #266455 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	8.0	1351	10.0	1529
2400	19.0	1901	21.0	2040

143 Gr. (w/Gas Check)
Bullet #266469 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	8.0	1296	10.0	1481
2400	15.0	1545	18.0	1763

6.5 X 54mm MANNLICHER-SCHOENAUER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .264″
Maximum Case Length ..... 2.110″
Trim-to Length ..... 2.100″
Maximum Overall Length (With Bullet) ..... 3.010″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 28

TEST COMPONENTS

Cases ..... Norma
Primers ..... Remington 9½
Cast Bullet Used ..... *266305 - 103 Gr.
*Gas Check 266324 - 119 Gr.
*266455 - 129 Gr.
*266469 - 143 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Custom Mauser
Barrel Length ..... 20″
Twist ..... 1-7½″
Groove Diameter ..... .265″

NOTE: Better than half of the rifles which we have encountered in this caliber show signs of excessive headspace. Before using a 6.5 x 54 M/M rifle, we recommend that its headspace be checked by a competent gunsmith.

103 Gr. (w/Gas Check) Bullet #266305 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	12.0	1535	19.0	2114
IMR4227	13.0	1526	22.0	2257
IMR4198	16.0	1655	24.0	2183
IMR4895	20.0	1524	31.0	2232

119 Gr. Bullet #266324 (#2 alloy)

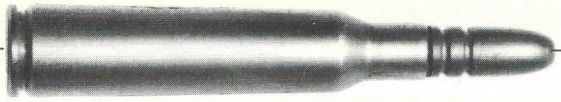
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	12.0	1466	19.0	2004
IMR4227	13.0	1508	21.5	2092
IMR4198	16.0	1592	24.0	2127
IMR4895	20.0	1519	31.0	2178

129 Gr. (w/Gas Check) Bullet #266455 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	12.0	1466	19.0	1996
IMR4227	13.0	1474	21.5	2074
IMR4198	16.0	1639	23.0	2066
IMR4895	20.0	1602	31.0	2257

143 Gr. (w/Gas Check) Bullet #266469 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	12.0	1390	19.0	1923
IMR4227	13.0	1382	21.0	1953
IMR4198	16.0	1510	22.0	1915
IMR4895	19.0	1400	30.0	2132



6.5 X 55
SWEDISH MAUSER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .266″
Maximum Case Length ..... 2.160″
Trim-to-Length ..... 2.150″
Maximum Overall Length (With Bullet) ..... 3.062″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 27

TEST COMPONENTS

Cases ..... Norma
Primers ..... Remington 9½
Cast Bullet Used ..... 266324 - 119 Gr. - 2.625″
*Gas Check *266455 - 129 Gr. - 2.710″
*266469 - 143 Gr. - 2.825″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... HVA Bolt Action
Barrel Length ..... 23.5″
Twist ..... 1-7½″
Groove Diameter ..... .266″

NOTE: Due to the wide variations in groove diameters in firearms chambered for the 6.5 x 55 cartridge, we suggest you slug your bore to determine the correct bullet diameter for your rifle.

119 Gr.
Bullet #266324 (#2 alloy)

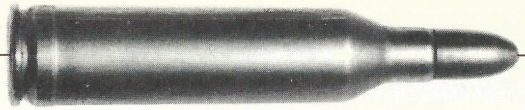
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1235	10.0	1575
Green Dot	8.0	1320	11.0	1640
Unique	9.0	1390	12.0	1690
700X	7.0	1240	10.0	1570
PB	8.0	1240	12.0	1640
SR7625	9.0	1295	13.0	1685
230	7.0	1215	10.5	1615
630	10.0	1365	16.0	1820

129 Gr. (w/Gas Check)
Bullet #266455 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1175	10.0	1515
Green Dot	8.0	1270	11.0	1585
Unique	9.0	1340	12.0	1640
700X	7.0	1200	10.0	1525
PB	8.0	1215	12.0	1580
SR7625	9.0	1290	13.0	1645
230	7.0	1210	10.0	1545
630	10.0	1315	16.0	1800

143 Gr. (w/Gas Check)
Bullet #266469 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1135	9.5	1335
Green Dot	8.0	1205	10.5	1465
Unique	9.0	1275	11.5	1525
700X	7.0	1135	9.5	1330
PB	8.0	1145	11.5	1465
SR7625	9.0	1220	12.5	1525
230	7.0	1135	9.5	1335
630	10.0	1300	15.5	1710



6.5 REMINGTON MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .264″
Maximum Case Length ..... 2.170″
Trim-to-Length ..... 2.160″
Maximum Overall Length (With Bullet) ..... 2.800″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 9½
Cast Bullet Used ..... 266324 - 119 Grs. - 2.635″
*Gas Check *266455 - 129 Grs. - 2.605″
*266469 - 143 Grs. - 2.615″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... M 700 Remington
Barrel Length ..... 24″
Twist ..... 1-9″
Groove Diameter ..... .264″

NOTE: For cast bullet loads use only standard large rifle primers.

119 Gr. (w/Gas Check) Bullet #266324 (#2 alloy)

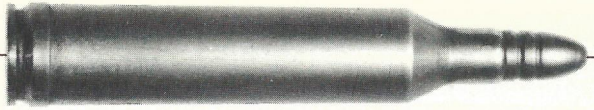
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.0	1340	14.5	1785
Green Dot	10.0	1485	15.5	1880
Unique	11.0	1545	16.5	1930
700X	9.0	1345	14.5	1780
PB	10.0	1405	15.5	1815
SR7625	11.0	1470	16.5	1860
230	9.0	1345	14.5	1785

129 Gr. (w/Gas Check) Bullet #266455 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.0	1275	14.0	1725
Green Dot	10.0	1445	15.0	1835
Unique	11.0	1500	16.0	1885
700X	9.0	1300	14.0	1730
PB	10.0	1370	15.0	1765
SR7625	11.0	1435	16.0	1810
230	9.0	1320	14.0	1710

143 Gr. (w/Gas Check) Bullet #266469 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	8.5	1215	13.5	1620
Green Dot	9.5	1275	14.5	1655
Unique	10.5	1390	15.5	1755
700X	8.5	1200	13.5	1615
PB	9.5	1205	14.5	1595
SR7625	10.5	1335	15.5	1700
230	8.5	1220	13.5	1625



.264 WINCHESTER MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .264″
Maximum Case Length ..... 2.500″
Trim-to Length ..... 2.490″
Maximum Overall Length (With Bullet) ..... 3.340″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Winchester/Western
Primers ..... Winchester 8½ - 120
Cast Bullet Used ..... 266324 - 119 Grs. - 2.991″
*Gas Check *266455 - 129 Grs. - 2.983″
*266469 - 143 Grs. - 3.068″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Universal Receiver Velocity BBL
Barrel Length ..... 24″
Twist ..... 1-9″
Groove Diameter ..... .264″

119 Gr.
Bullet #266324 (#2 alloy)

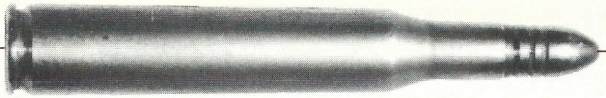
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	12.0	1565	17.0	1885
Green Dot	13.0	1620	18.0	1925
Unique	14.0	1670	19.0	1960
700X	12.0	1565	17.0	1875
PB	13.0	1535	18.0	1855
SR7625	14.0	1605	19.0	1905
230	12.0	1575	17.0	1880
630	17.0	1695	22.0	1985

129 Gr. (w/Gas Check)
Bullet #266455 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	12.0	1535	16.5	1835
Green Dot	13.0	1590	17.0	1850
Unique	13.5	1600	18.5	1930
700X	11.5	1490	16.5	1840
PB	12.5	1470	17.5	1815
SR7625	13.5	1510	18.5	1850
230	11.5	1490	16.5	1855
630	16.5	1685	21.5	1965

143 Gr. (w/Gas Check)
Bullet #266469 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	11.0	1390	16.0	1715
Green Dot	12.5	1470	16.5	1735
Unique	13.0	1495	18.0	1795
700X	11.0	1380	16.0	1715
PB	12.0	1375	17.0	1690
SR7625	13.0	1430	18.0	1730
230	11.0	1400	16.0	1735
630	16.0	1585	21.0	1865



.270 WINCHESTER (6.9 X 64 MM)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .277″
Maximum Case Length ..... 2.540″
Trim-to Length ..... 2.530″
Maximum Overall Length (With Bullet) ..... 3.340″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases ..... Winchester
Primers ..... Winchester 120
Cast Bullet Used ..... *280468 - 117 Gr.
*Gas Check *280473 - 128 Gr.
*280412 - 139 Gr.

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 26″
Twist ..... 1-10″
Groove Diameter ..... .277″

NOTE: Accuracy loads with cast bullets in this caliber showed a maximum extreme variation in a test string of 19 F.P.S. Some of these cast bullet accuracy loads showed as little variation as 5 F.P.S. Extreme velocity spread on all cast bullet loads was 51 F.P.S.

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1555	19,000	13.0	1796	39,400
PB	11.5	1609	27,600	14.3	1822	41,100
SR7625	11.0	1560	22,000	14.0	1784	40,700
SR4756	12.6	1677	27,000	16.0	1912	41,600
Red Dot	12.0	1716	33,500	14.0	1890	40,700
Unique	13.0	1836	31,000	15.7	2057	39,900

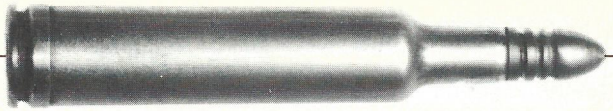
117 Gr. (w/Gas Check)
Bullet #280468 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1489	25,200	13.0	1729	39,900
PB	11.0	1499	27,000	13.5	1695	39,400
SR7625	11.0	1505	25,800	13.5	1683	39,000
SR4756	12.0	1554	24,600	15.5	1833	39,900
Red Dot	11.0	1587	29,400	13.5	1780	39,400
Green Dot	11.5	1607	31,500	14.5	1839	40,300
Unique	12.0	1698	28,200	15.3	1962	40,300
Herco	12.5	1647	30,500	15.5	1894	39,400

128 Gr. (w/Gas Check)
Bullet #280473 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1462	26,400	12.5	1662	38,100
PB	10.5	1431	23,400	13.0	1614	36,000
SR7625	10.5	1408	22,800	13.0	1593	36,400
SR4756	11.5	1490	20,400	15.0	1731	37,700
Red Dot	10.5	1495	28,200	13.0	1700	36,400
Green Dot	10.5	1542	31,000	13.0	1646	35,500
Unique	11.5	1612	27,000	14.8	1860	37,700
Herco	12.0	1568	28,200	15.0	1796	36,900

139 Gr. (w/Gas Check)
Bullet #280412 (#2 alloy)



.270 WEATHERBY MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .277″
Maximum Case Length .....2.550″
Trim-to Length .....2.540″
Maximum Overall Length (With Bullet) .....3.250″
Primer Size .....Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases .....Weatherby
Primers .....Remington 9½
Cast Bullet Used .....*280468 - 117 Gr.
*Gas Check *280473 - 128 Gr.
*280412 - 139 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Weatherby Mark V
Barrel Length .....26″
Twist .....1-12″
Groove Diameter ..... .277″

NOTE: The data for this cartridge was obtained in a Weatherby rifle and is intended for Weatherby rifles only. The free-boring constructed into these firearms allow higher velocities at safe working pressures. For custom rifles which are not free-bored, maximum loads should be reduced a full 5%. Even then, they should be approached with caution.
Do not use the magnum primers, however, with cast bullets. Only standard large rifle primers should be used with cast bullet loads.

109 Gr. (w/Gas Check) Bullet #280468 (#2 alloy)

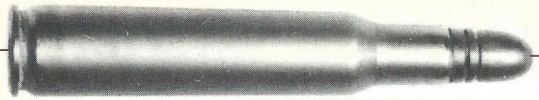
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.0	1875	18.0	2169
2400	22.0	1956	28.0	2364
IMR4227	27.0	2096	29.0	2232

128 Gr. (w/Gas Check) Bullet #280473 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.0	1756	16.0	1882
2400	20.0	1785	26.0	2118
IMR4227	25.0	1964	27.0	2053

139 Gr. (w/Gas Check) Bullet #280412 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	13.0	1639	16.0	1838
2400	20.0	1762	25.0	2040
IMR4227	24.0	1879	26.0	1988



7 X 57 MAUSER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .284″
Maximum Case Length .....2.235″
Trim-to-Length .....2.225″
Maximum Overall Length (With Bullet) .....3.065″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Federal
Primers .....Federal 210
Cast Bullet Used .....*287448 - 123 Gr. - 2.690″
*Gas Check *287346 - 139 Gr. - 2.685″
*287405 - 154 Gr. - 2.800″
*287308 - 168 Gr. - 2.800″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....24″
Twist .....1 - 8¾″
Groove Diameter ..... .284″

NOTE: Most 7 M/M's are imported rifles and their groove diameters can vary considerably. We recommend that you slug your barrel to determine its exact groove diameter.

123 Gr. (w/Gas Check)
Bullet #287448 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	9.0	1405	24,000	14.0	1845	41,600
Green Dot	10.0	1550	28,200	14.0	1835	39,900
Unique	11.0	1610	25,800	15.5	1985	41,100
700X	9.0	1425	24,600	12.5	1755	41,600
PB	10.0	1490	28,800	12.5	1665	39,400
SR7625	10.5	1515	28,800	13.0	1690	39,000
230	9.0	1430	N/A	12.5	1765	39,400
630	15.0	1735	24,000	21.0	2155	34,500

139 Gr. (w/Gas Check)
Bullet #287346 (#2 alloy)

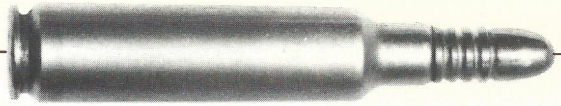
Powder	Sug. Start Grs.	F.P S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	9.0	1350	26,400	12.0	1625	38,100
Green Dot	9.5	1380	24,600	12.5	1640	39,400
Unique	10.5	1490	25,200	15.0	1850	39,900
700X	8.5	1310	24,000	11.5	1590	40,300
PB	9.5	1305	N/A	12.0	1540	37,700
SR7625	10.0	1405	30,000	12.0	1540	36,900
230	9.0	1350	24,600	11.5	1595	38,100
630	15.0	1675	25,800	21.0	2050	37,300

154 Gr. (w/Gas Check)
Bullet #287405 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	8.5	1245	22,800	11.5	1525	38,100
Green Dot	9.0	1315	25,200	12.0	1540	37,700
Unique	10.0	1405	27,000	14.5	1685	39,900
700X	8.5	1240	24,600	11.0	1485	39,000
PB	9.5	1245	25,200	12.0	1475	38,600
SR7625	9.5	1230	24,000	12.0	1465	38,600
230	9.0	1290	27,000	11.5	1535	39,400
630	14.5	1535	24,000	20.5	1990	37,300

168 Gr. (w/Gas Check)
Bullet #287308 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	8.5	1200	25,200	11.5	1465	38,100
Green Dot	9.0	1215	24,000	12.0	1485	36,900
Unique	10.0	1335	25,800	14.5	1610	38,600
700X	8.5	1190	26,400	10.5	1400	36,900
PB	9.5	1195	25,200	12.0	1415	38,100
SR7625	9.5	1185	22,800	11.5	1385	37,700
230	8.5	1190	23,400	11.0	1435	36,900
630	14.5	1465	22,800	20.5	1905	37,700



.284 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .284″
Maximum Case Length ..... 2.170″
Trim-to Length ..... 2.160″
Maximum Overall Length (With Bullet) ..... 2.800″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester 8½ - 120
Cast Bullet Used .....*287448 - 123 Gr. - 2.612″
*Gas Check *287346 - 139 Gr. - 2.765″
*287405 - 154 Gr. - 2.794″
*287308 - 168 Gr. - 2.700″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Ruger M77
Barrel Length .....22″
Twist .....1-10″
Groove Diameter ..... .284″

NOTE: Maximum loads for individual rifles seem to vary quite a bit in this caliber. We recommend that maximum loadings be approached with caution.

123 Gr. (w/Gas Check) Bullet #287448 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.0	1415	15.5	1950
Green Dot	10.0	1510	16.0	1965
Unique	11.0	1565	17.0	2015
700X	9.0	1425	15.5	1955
PB	10.0	1440	16.0	1835
SR7625	11.0	1510	17.0	1955
IMR4227	17.0	1550	21.0	1815
230	9.0	1435	15.5	1960
630	15.0	1650	20.0	1995

139 Gr. (w/Gas Check) Bullet #287346 (#2 alloy)

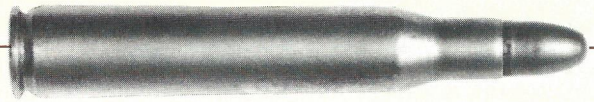
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.0	1340	15.5	1830
Green Dot	10.0	1410	16.0	1855
Unique	11.0	1475	17.0	1885
700X	9.0	1335	15.5	1830
PB	10.0	1360	16.0	1780
SR7625	11.0	1415	17.0	1840
IMR4227	17.0	1525	21.0	1785
230	9.0	1345	15.5	1845
630	15.0	1590	20.0	1915

154 Gr. (W/Gas Check) Bullet #287405 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1370	15.5	1760
Green Dot	11.0	1435	16.0	1780
Unique	12.0	1500	17.0	1840
700X	10.0	1380	15.0	1735
PB	11.0	1375	16.0	1715
SR7625	11.5	1410	16.5	1740
IMR4227	17.5	1535	21.0	1745
230	10.0	1385	15.5	1770
630	15.5	1580	20.0	1870

168 Gr. (w/Gas Check) Bullet #287308 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1310	15.5	1690
Green Dot	11.0	1370	16.0	1705
Unique	12.0	1430	17.0	1755
700X	10.0	1310	15.0	1660
PB	11.0	1305	15.5	1610
SR7625	11.5	1330	16.0	1625
IMR4227	17.5	1350	21.0	1620
230	10.0	1320	15.5	1690
630	15.5	1505	19.5	1745



.280 REMINGTON

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .284″
Maximum Case Length .....2.540″
Trim-to Length .....2.530″
Maximum Overall Length (With Bullet) .....3.330″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Remington-Peters
Primers .....Remington 9½
Cast Bullet Used .....*287448 - 123 Gr. - 2.612″
*Gas Check *287346 - 139 Gr. - 2.765″
*287405 - 154 Gr. - 2.794″
*287308 - 168 Gr. - 2.700″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Remington 742
Barrel Length .....22″
Twist .....1-9½″
Groove Diameter ..... .284″

NOTE: This cartridge gave very uniform velocities and excellent accuracy with all the powders and bullets tested.

123 Gr. (w/Gas Check) Bullet #287448 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	11.0	1585	16.0	1955
Green Dot	11.5	1600	16.5	1980
Unique	12.0	1625	17.0	1985
700X	10.5	1545	15.0	1890
PB	11.0	1500	15.5	1840
SR7625	11.5	1535	16.0	1880
230	11.0	1595	16.0	1970
630	15.0	1660	20.0	1960

139 Gr. (w/Gas Check) Bullet #287346 (#2 alloy)

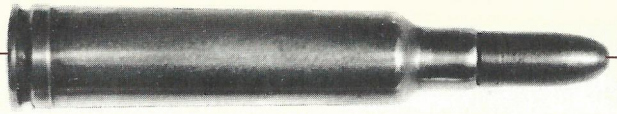
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	11.0	1495	15.5	1815
Green Dot	11.5	1525	16.0	1840
Unique	12.0	1535	17.0	1890
700X	10.5	1465	14.5	1750
PB	11.0	1420	15.5	1750
SR7625	11.5	1460	16.0	1775
230	11.0	1505	15.5	1825
630	15.0	1585	20.0	1895

154 Gr. (w/Gas Check) Bullet #287405 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.5	1405	15.0	1710
Green Dot	11.0	1425	15.5	1735
Unique	11.5	1440	16.5	1785
700X	10.0	1365	14.0	1645
PB	10.5	1330	15.0	1640
SR7625	11.0	1370	15.5	1670
230	10.5	1420	15.0	1725
630	14.5	1485	19.5	1815

168 Gr. (w/Gas Check) Bullet #287308 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1305	14.5	1600
Green Dot	10.5	1325	15.0	1630
Unique	11.0	1345	16.0	1695
700X	9.5	1250	13.5	1535
PB	10.0	1225	14.5	1525
SR7625	10.5	1240	15.0	1550
230	10.0	1305	14.5	1605
630	14.0	1415	19.0	1725



7 X 61 MM SHARPE & HART

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .284″
Maximum Case Length ..... 2.402″
Trim-to Length ..... 2.392″
Maximum Overall Length (With Bullet) ..... 3.190″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Norma
Primers ..... Remington 9½
Cast Bullet Used ..... *287346 - 139 Gr.
*Gas Check *287405 - 154 Gr.
*287308 - 168 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Shultz and Larsen 65DL
Barrel Length ..... 24″
Twist ..... 1-10″
Groove Diameter ..... .285″

NOTE: The 7 x 61 M/M proved to be one of the most efficient cartridges we tested. Accuracy was good and velocities were extremely uniform. Compared to other magnum cases, this cartridge produced very high velocities with minimum amounts of powder. The rifle used for testing was free-bored. For rifles which do not have a free-bored throat, this data should be reduced a full 5%. Even then, maximum loading should be approached with caution.

139 Gr. (w/Gas Check) Bullet #287346 (#2 alloy)

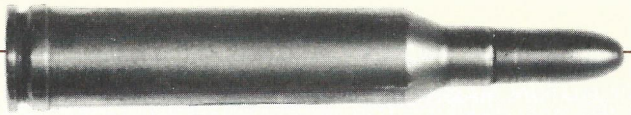
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	15.0	1805	18.0	2016
2400	18.0	1658	24.0	2070
IMR4227	22.0	1828	26.0	2092

154 Gr. (w/Gas Check) Bullet #287405 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.0	1683	17.0	1876
2400	17.0	1564	23.0	2008
IMR4227	22.0	1811	25.0	1988

168 Gr. (w/Gas Check) Bullet #287308 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	13.0	1557	16.0	1754
2400	16.0	1508	22.0	1858
IMR4227	20.0	1655	24.0	1872



7mm REMINGTON MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .284″
Maximum Case Length ..... 2.500″
Trim-to Length ..... 2.490″
Maximum Overall Length (With Bullet) ..... 3.290″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Winchester
Primers ..... Remington 9½ M
Cast Bullet Used ..... *287448 - 123 Gr.
*Gas Check *287346 - 139 Gr.
*287405 - 154 Gr.
*287308 - 168 Gr.

TEST (Pressure & Velocity) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 26″
Twist ..... 1-9½″
Groove Diameter ..... .284″

NOTE: Ballistic uniformity was superb throughout our testing.

123 Gr. (w/Gas Check)
Bullet #287448 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	14.0	1793	25,200	18.5	2112	38,100
PB	16.0	1857	25,200	20.5	2141	40,300
SR7625	16.0	1844	25,200	21.0	2168	40,300
SR4756	20.0	2077	25,800	24.5	2321	39,900
Red Dot	18.0	2084	31,500	21.0	2270	40,700
Green Dot	16.0	1924	24,600	18.0	2042	29,400

139 Gr. (w/Gas Check)
Bullet #287346 (#2 alloy)

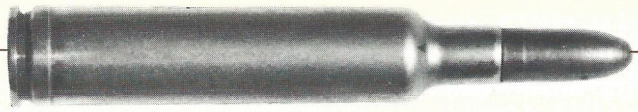
Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	14.5	1722	27,600	17.5	1929	37,700
PB	16.5	1756	27,600	19.5	1939	38,600
SR7625	17.0	1795	31,000	20.0	1972	39,900
SR4756	20.0	1931	30,000	23.5	2153	40,700
Red Dot	17.0	1903	31,500	20.0	2078	40,700
Green Dot	15.0	1731	24,600	18.0	1930	31,000

154 Gr. (w/Gas Check)
Bullet #287405 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	13.5	1601	25,800	16.5	1798	34,000
PB	15.5	1652	26,400	18.5	1820	36,000
SR7625	15.5	1635	25,800	19.0	1851	37,700
SR4756	19.0	1813	25,800	22.5	2004	36,900
Red Dot	16.0	1782	30,000	19.0	1943	38,100
Green Dot	15.0	1675	25,800	18.0	1849	31,000
630	18.0	1730	18,000	21.0	1903	20,400

168 Gr. (w/Gas Check)
Bullet #287308 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	13.0	1504	23,400	16.0	1701	33,000
PB	15.0	1553	25,800	18.0	1723	34,500
SR7625	15.0	1541	25,200	18.5	1749	35,500
SR4756	18.5	1728	26,400	22.0	1912	36,400
Red Dot	14.5	1604	26,400	18.0	1807	33,500
Green Dot	14.5	1577	23,400	18.0	1786	31,500
630	17.5	1643	19,200	21.0	1816	21,000



7mm WEATHERBY MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .284″
Maximum Case Length ..... 2.550″
Trim-to Length ..... 2.540″
Maximum Overall Length (With Bullet) ..... 3.260″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Weatherby
Primers ..... Remington 9½
Cast Bullet Used ..... *287405 - 154 Gr.
*Gas Check *287308 - 168 Gr.
287221 - 179 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Weatherby Mark V
Barrel Length ..... 26″
Twist ..... 1-12″
Groove Diameter ..... .2825″

NOTE: The data listed for this cartridge was obtained in a Weatherby rifle and is intended for Weatherby rifles only. The free-boring constructed into these firearms allow higher velocities at safe working pressures. For custom rifles which are not free-bored, maximum loads should be reduced a full 5%. Even then, they should be approached with caution.
Only standard large rifle primers should be used with cast bullet loads.

154 Gr. (w/Gas Check) Bullet #287405 (#2 alloy)

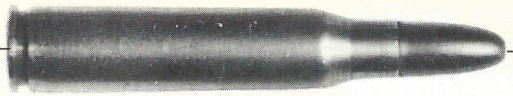
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	15.0	1683	18.0	1872
2400	18.0	1559	24.0	1930
IMR4227	23.0	1760	26.0	1930

168 Gr. (w/Gas Check) Bullet #287308 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.0	1572	17.0	1763
2400	17.0	1501	23.0	1828
IMR4227	22.0	1686	25.0	1838

179 Gr. Bullet #287221 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	13.0	1481	16.0	1674
2400	16.0	1412	22.0	1763
IMR4227	21.0	1592	24.0	1742



7.35mm ITALIAN (TERNI)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .299″ & .301″
Maximum Case Length .....2.01″
Trim-to Length .....2.00″
Maximum Overall Length (With Bullet) .....2.755″
Primer Size .....Large Rifle
Lyman Shell Holder Number 28

TEST COMPONENTS

Cases .....Formed from Norma 6.5 x 54 brass
Primers .....Winchester 8½ - 120
Cast Bullet Used .....*300136 - 150 Gr.
*Gas Check

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Italian Military Carbine
Barrel Length .....21″
Twist .....Gain
Groove Diameter ..... .302″

NOTE: Here again a large variation in groove diameters exist. Match the bullet diameter as closely as possible to the groove diameter.
Lead bullets can be sized .299″ or .301″. Most actual groove diameters run between .300″ and .302″. Due to the relatively poor design and workmanship of these rifles, we do not recommend their use except for lead bullet shooting.

150 Gr. (w/Gas Check)
Bullet #300136 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	16.0	1650	22.0	2070
IMR4227	16.0	1535	25.0	2136
IMR4198	19.0	1595	30.0	2262
IMR3031	24.0	1625	33.0	2247

30 MI CARBINE

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length ..... 1.290″
Trim-to Length ..... 1.286″
Maximum Overall Length (With Bullet) ..... 1.680″
Primer Size ..... Small Rifle
Lyman Shell Holder Number 19

TEST COMPONENTS

Cases ..... Remington
Primers ..... Remington 6½
Cast Bullets Used ..... *311359 - 120 Gr.
*Gas Check *311576 - 123 Gr.
311410 - 130 Gr.

TEST (Velocity and Pressure) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 20″
Twist ..... 1-20″
Groove Diameter ..... .308″

NOTE: Best ballistic uniformity was obtained with bullet No. 311410 using AL-8 powder. Not all carbines will function semi-automatically with all loads. Bullet No. 311410 with AL-8 or IMR4227 will function all carbines we have tested. This cartridge headspaces on the mouth, and case length is, therefore, critical. Never trim cases shorter than the trim-to length shown and never crimp bullets.

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
SR7625	4.6	1194	22,800	5.6	1368	39,000
SR4756	5.5	1298	23,400	6.5	1463	38,100
IMR4227	11.5	1497	27,000	13.3*	1733	39,000
Unique	5.5	1388	27,600	6.5	1555	38,600
2400	11.0	1633	31,500	12.5*	1828	40,300
AL-8	9.5	1577	32,000	11.0*	1728	39,400

* Designates a compressed powder charge

120 Gr. (w/Gas Check)
Bullet #311359 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
SR4756	5.1	1232	23,400	6.1	1407	39,400
IMR4227	11.0	1426	25,800	13.1*	1709	40,300
Unique	5.0	1300	22,200	6.3	1526	39,000
2400	10.8	1623	29,400	12.3*	1795	38,100
AL-8	9.2	1510	31,500	10.8*	1727	40,700

* Designates a compressed powder charge

123 Gr. (w/Gas Check)
Bullet #311576 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
SR4756	5.0	1180	22,000	6.0	1371	37,300
IMR4227	10.6	1366	24,600	12.7*	1647	38,600
Unique	4.9	1260	23,400	6.1	1468	35,000
2400	10.5	1564	28,800	12.0*	1733	38,600
AL-8	9.0	1497	30,500	10.4*	1675	40,300

* Designates a compressed powder charge

130 Gr.
Bullet #311410 (#2 alloy)

30 REMINGTON

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .307″ & .308″
Maximum Case Length .....2.050″
Trim-to Length .....2.040″
Maximum Overall Length (With Bullet) .....2.525″
Primer Size .....Large Rifle
Lyman Shell Holder Number 15

TEST COMPONENTS

Cases .....Remington
Primers .....Remington 9½
Cast Bullets Used .....*311291 - 173 Gr.
*Gas Check

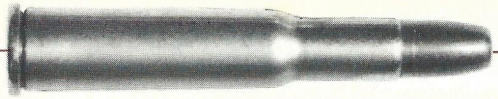
TEST (Velocity) SPECIFICATIONS

Firearm Used .....Remington 81
Barrel Length .....22″
Twist .....1-12″
Groove Diameter ..... .307″

NOTE: Groove diameters of rifles in this caliber may run a bit tight, (as small as .306 dia.). We recommend sizing to groove diameter.

173 Gr. (w/Gas Check)
Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	16.0	1730	20.0	2000
IMR4227	17.5	1754	22.0	2024
IMR4198	19.0	1697	25.5	2118



.303 SAVAGE

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length ..... 2.015″
Trim-to Length ..... 2.010″
Maximum Overall Length (With Bullet) ..... 2.520″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 7

TEST COMPONENTS

Cases ..... Remington
Primers ..... Remington 9½
Cast Bullets Used ..... *311291 - 173 Gr.
*Gas Check *311334 - 193 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Savage 99
Barrel Length ..... 26″
Twist ..... 1-12″
Groove Diameter ..... .308″

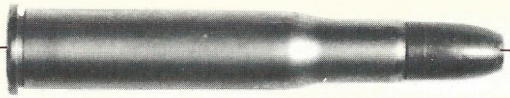
NOTE: The rifles chambered for this cartridge which we have tested, show no appreciable variation in standard (.308) groove diameter. Our consumer correspondence, however, indicates that some grooves may run a little on the large size. We suggest that you slug your barrel before reloading. We suggest the use of a cast bullet which is sized to your groove diameter.

173 Gr. (w/Gas Check)
Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	8.0	1326	11.0	1930
2400	15.0	1625	20.0	1980
IMR4227	16.0	1618	22.0	2008

193 Gr. (w/Gas Check)
Bullet #311334 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	7.0	1273	10.0	1413
2400	14.0	1411	19.0	1811
IMR4227	16.0	1492	22.5	1934



30/30 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length .....2.0395″
Trim-to Length .....2.028″
Maximum Overall Length (With Bullet) .....2.550″
Primer Size .....Large Rifle
Lyman Shell Holder Number 6

TEST COMPONENTS

Cases .....Winchester
Primers .....Winchester 8½-120
Cast Bullets Used .....*311441 - 120 Gr.
*Gas Check *311440 - 150 Gr.
*311291 - 173 Gr.
*31141 - 176 Gr.
*311407 - 183 Gr.

TEST (Pressure and Velocity) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....26″
Twist .....1-12″
Groove Diameter ..... .308″

NOTE: The use of only flat or blunt nosed bullets is required for use in tubular magazines. Crimping is necessary to keep the bullet in place in tubular magazines. Some older rifles for this cartridge are marked 30 W.C.F.

120 Gr. (w/Gas Check)
Bullet #311441 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	7.0	1415	27,600	8.9	1643	38,600
PB	7.0	1320	22,200	9.7	1602	38,600
SR7625	7.5	1379	23,400	10.0	1638	36,400
SR4756	8.5	1474	23,400	11.9	1793	37,700
Red Dot	7.0	1400	25,200	10.0	1747	38,600
Unique	7.5	1480	21,600	11.4	1913	36,400
Green Dot	7.5	1430	25,200	10.5	1738	38,600
Herco	10.0	1645	27,000	12.5	1907	36,900

150 Gr. (w/Gas Check)
Bullet #311440 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	6.5	1235	27,000	8.0	1401	36,400
PB	7.0	1222	26,400	9.0	1422	38,100
SR7625	7.5	1283	27,600	9.2	1413	36,900
SR4756	8.0	1282	22,200	11.1	1573	36,400
Red Dot	6.8	1257	25,800	9.0	1481	38,100
Unique	7.5	1333	21,600	11.0	1691	37,300
Green Dot	7.0	1231	23,400	9.5	1478	36,900
Herco	9.0	1386	25,800	12.0	1660	36,900

173 Gr. (w/Gas Check)
Bullet #311291 (#2 alloy)

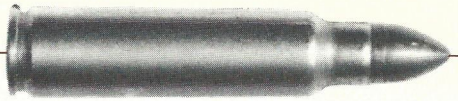
Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	6.0	1101	26,400	7.5	1253	34,000
PB	6.5	1093	24,000	8.7	1311	36,900
SR7625	6.5	1107	22,800	9.0	1348	36,400
SR4756	7.0	1123	19,800	10.5	1431	35,000
Red Dot	6.5	1145	24,600	8.5	1363	34,500
Unique	7.0	1211	19,800	10.6	1568	36,000
Green Dot	7.0	1126	23,400	9.0	1348	33,500
Herco	9.0	1328	28,200	11.5	1538	38,100

176 Gr. (w/Gas Check)
Bullet #31141 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	6.0	1124	24,600	7.5	1269	34,000
PB	6.5	1100	23,400	8.7	1286	36,900
SR7625	6.5	1118	22,800	9.0	1337	36,900
SR4756	7.0	1102	19,800	10.5	1423	36,400
Red Dot	6.5	1159	24,600	8.5	1348	34,500
Unique	7.0	1240	21,600	10.6	1555	35,500
Green Dot	7.0	1192	25,200	9.0	1373	33,500
Herco	8.5	1281	25,800	11.0	1505	33,000

183 Gr. (w/Gas Check)
Bullet #311407 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	6.0	1102	26,400	7.5	1273	37,700
PB	6.5	1085	24,000	8.5	1279	38,100
SR7625	6.5	1087	22,800	9.0	1302	38,900
Unique	7.0	1203	24,000	10.4	1519	36,900
Green Dot	6.5	1131	25,800	8.5	1306	35,500
Herco	9.0	1301	27,600	11.0	1472	36,400



.300 SAVAGE

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .309″
Maximum Case Length .....1.871″
Trim-to Length .....1.865″
Maximum Overall Length (With Bullet) .....2.600″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Federal
Primers .....Federal 210
Cast Bullet Used ..... *311359 - 120 Gr. - 2.280″
*Gas Check *311576 - 123 Gr. - 2.244″
*311440 - 150 Gr. - 2.315″
*311466 - 155 Gr. - 2.435″
*311291 - 173 Gr. - 2.358″
*311467 - 180 Gr. - 2.525″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....25″
Twist .....1-12″
Groove Diameter ..... .309″

NOTE: Best results were obtained with the 150 grain cast bullet or heavier.

118 Gr. (w/Gas Check)
Bullet #311359 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	CUP	Max. Grs.	F.P.S.	CUP
Red Dot	8.0	1490	25,200	11.0	1845	39,900
Green Dot	8.5	1525	22,800	12.0	1850	39,900
Unique	9.0	1530	N/A	13.0	1960	36,400
700X	8.0	1475	25,200	11.0	1775	42,000
PB	9.0	1490	25,800	12.0	1800	41,600
SR7625	9.5	1550	28,200	12.5	1815	42,900
SR4756	10.0	1555	23,400	14.0	1920	41,600
230	8.0	1485	24,000	11.5	1850	39,900

123 Gr. (w/Gas Check)
Bullet #311576 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	CUP	Max. Grs.	F.P.S.	CUP
Red Dot	8.0	1480	25,200	11.5	1825	39,400
Green Dot	8.5	1505	24,600	12.0	1845	38,600
Unique	9.0	1530	N/A	13.5	1955	37,700
700X	8.0	1470	26,400	11.0	1780	42,000
PB	9.0	1495	26,400	12.0	1770	40,700
SR7625	9.0	1485	25,200	12.0	1760	42,400
SR4756	10.0	1560	25,200	14.0	1900	39,900
230	8.0	1475	24,000	11.5	1825	39,400

150 Gr. (w/Gas Check)
Bullet #311440 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	CUP	Max. Grs.	F.P.S.	CUP
Red Dot	8.0	1335	26,400	11.0	1600	41,600
Green Dot	8.5	1370	27,000	11.5	1625	38,100
Unique	9.0	1385	23,400	12.5	1700	37,300
700X	8.0	1315	28,800	10.0	1515	39,000
PB	9.0	1335	28,200	11.0	1550	40,700
SR7625	9.0	1320	25,200	10.0	1505	38,600
SR4756	10.0	1385	23,400	13.0	1635	39,000
230	8.0	1320	24,600	11.0	1605	39,000

155 Gr. (w/Gas Check)
Bullet #311466 (#2 alloy)

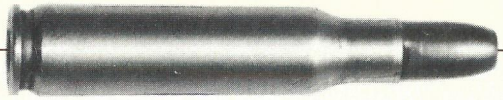
Powder	Sug. Start Grs.	F.P.S.	CUP	Max. Grs.	F.P.S.	CUP
Red Dot	8.0	1295	23,400	11.0	1570	39,000
Green Dot	8.5	1330	25,200	11.5	1595	38,100
Unique	9.0	1360	22,800	13.0	1705	37,700
700X	8.0	1310	24,600	10.5	1535	40,300
PB	9.0	1320	25,200	11.0	1500	37,300
SR7625	9.0	1305	24,600	11.0	1495	38,100
SR4756	10.0	1375	24,000	13.5	1665	41,100
230	8.0	1305	24,000	11.5	1630	40,300

173 Gr. (w/Gas Check)
Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	CUP	Max. Grs.	F.P.S.	CUP
Red Dot	7.5	1185	24,000	10.5	1460	37,700
Green Dot	8.0	1205	23,400	11.0	1485	36,400
Unique	8.5	1235	22,200	13.0	1625	39,400
700X	8.0	1245	26,400	10.0	1420	39,000
PB	9.0	1250	30,500	11.0	1410	42,000
SR7625	9.0	1240	30,500	11.0	1415	41,600
SR4756	10.0	1310	25,800	12.5	1520	39,900
230	8.0	1255	27,000	11.0	1515	42,400

180 Gr. (w/Gas Check)
Bullet #311467 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	CUP	Max. Grs.	F.P.S.	CUP
Red Dot	7.5	1185	24,600	10.5	1425	38,100
Green Dot	8.0	1210	25,200	11.0	1470	38,100
Unique	8.5	1240	22,800	13.0	1600	38,100
700X	8.0	1230	28,800	10.0	1400	39,900
PB	8.5	1205	27,000	10.5	1370	38,100
SR7625	8.5	1195	25,800	10.5	1360	36,400
SR4756	10,0	1290	24,600	12.0	1450	36,000
230	8.0	1240	27,000	10.5	1455	39,900



.308 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length .....2.015″
Trim-to Length .....2.005″
Maximum Overall Length (With Bullet) .....2.800″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Winchester
Primers .....Winchester 8½ - 120
Cast Bullets Used .....*311359 - 120 Gr.
*Gas Check *311576 - 123 Gr.
*311440 - 150 Gr.
*311466 - 155 Gr.
*311291 - 173 Gr.
*31141 - 176 Gr.
*311467 - 180 Gr.
*311407 - 183 Gr.
*311334 - 193 Gr.

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....26″
Twist .....1-12″
Groove Diameter ..... .308″

NOTE: All loads showed a maximum extreme velocity spread of 51 F.P.S. If military cases are used, maximum loads should be reduced by two (2) full grains. This cartridge is capable of exceptionally fine accuracy with most component combinations.

120 Gr. (w/Gas Check)
Bullet #311359 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	9.0	1540	24,600	12.5	1879	40,300
PB	10.5	1601	24,600	13.5	1879	38,600
SR7625	12.0	1704	26,400	15.0	1953	39,400
Red Dot	10.0	1623	24,000	14.0	2000	39,400
Unique	12.0	1831	24,600	17.0	2272	40,700
Green Dot	11.0	1692	25,200	15.0	2049	40,300
Herco	14.0	1886	25,800	17.0	2159	38,600

123 Gr. (w/Gas Check)
Bullet #311576 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	9.0	1508	24,600	12.3	1845	37,700
PB	10.5	1575	25,800	13.5	1838	39,900
SR7625	11.0	1600	27,000	14.0	1851	39,000
Red Dot	10.0	1617	25,200	14.0	1968	38,600
Unique	12.0	1810	24,000	17.0	2252	40,700
Green Dot	11.0	1683	25,800	15.0	2012	40,300
Herco	14.0	1879	28,800	17.0	2136	39,400

150 Gr. (w/Gas Check)
Bullet #311440 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	9.0	1364	26,400	12.0	1630	39,900
PB	10.5	1432	30,000	13.0	1609	39,900
SR7625	11.5	1481	30,500	14.0	1661	39,400
SR4756	12.5	1524	26,400	16.0	1795	39,000
Red Dot	10.0	1445	26,400	13.5	1742	40,300
Unique	11.5	1616	28,200	15.0	1920	39,900
Green Dot	10.5	1472	27,000	13.5	1715	39,900
Herco	13.5	1694	30,000	16.0	1858	38,600

155 Gr. (w/Gas Check)
Bullet #311466 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	9.0	1407	28,200	11.5	1625	39,900
PB	10.0	1405	29,400	12.5	1613	39,400
SR7625	11.0	1490	30,500	13.0	1650	37,700
SR4756	12.0	1512	24,600	16.0	1826	39,900
Red Dot	10.0	1466	27,600	13.0	1730	40,700
Unique	11.0	1586	26,400	15.0	1933	41,000
Green Dot	10.5	1461	25,200	13.5	1724	38,600
Herco	13.0	1623	27,600	15.5	1824	39,000

173 Gr. (w/Gas Check)
Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	8.0	1209	23,400	11.5	1547	39,900
PB	9.0	1220	22,200	12.5	1553	38,100
SR7625	10.0	1290	28,800	13.0	1560	39,900
SR4756	12.0	1416	30,000	14.5	1607	37,700
Red Dot	10.0	1367	28,800	12.5	1576	39,900
Unique	10.0	1368	23,400	15.0	1816	37,700
Green Dot	11.0	1434	30,000	13.0	1582	37,700
Herco	12.0	1479	26,400	15.5	1718	37,700

176 Gr. (w/Gas Check)
Bullet #31141 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	8.0	1206	24,000	11.5	1505	37,700
PB	9.0	1201	23,400	12.5	1479	40,300
SR7625	10.0	1272	24,600	13.0	1499	38,600
SR4756	12.0	1392	27,000	14.5	1587	37,700
Red Dot	10.0	1355	27,000	12.5	1565	39,000
Unique	10.0	1377	21,600	15.0	1802	37,700
Green Dot	11.0	1434	28,800	13.0	1587	35,500
Herco	12.0	1470	25,800	15.5	1733	37,700

180 Gr. (w/Gas Check)
Bullet #311467 (#2 alloy)

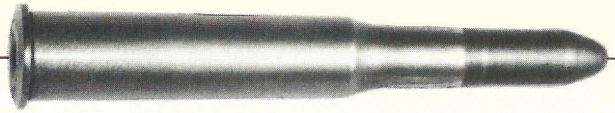
Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	8.0	1200	22,200	11.5	1513	39,900
PB	9.5	1240	22,200	12.5	1508	39,400
SR7625	10.5	1320	27,000	13.0	1508	36,900
SR4756	12.0	1379	24,600	14.5	1600	40,700
Red Dot	10.0	1352	27,600	12.5	1555	39,900
Unique	10.0	1373	23,400	14.5	1730	38,100
Green Dot	11.0	1424	30,000	13.0	1570	37,300
Herco	12.0	1457	25,800	15.5	1712	37,300

183 Gr. (w/Gas Check)
Bullet #311407 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	8.0	1188	24,000	11.5	1479	39,900
PB	9.0	1195	22,800	12.5	1478	39,900
SR7625	10.0	1254	24,600	12.5	1470	37,700
SR4756	12.0	1388	26,400	14.5	1577	36,400
Red Dot	10.0	1342	28,800	12.5	1538	39,400
Unique	10.0	1360	23,400	14.5	1715	39,900
Green Dot	10.5	1369	29,400	12.5	1527	37,300
Herco	12.5	1479	29,400	15.0	1655	37,700

193 Gr. (w/Gas Check)
Bullet #311334 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	8.0	1142	23,400	11.2	1398	36,900
PB	9.0	1146	23,400	12.5	1418	39,000
SR7625	10.0	1222	24,000	12.5	1402	37,000
SR4756	12.0	1331	25,800	14.5	1524	35,000
Red Dot	9.5	1270	25,800	12.5	1492	38,000
Unique	9.5	1291	21,600	14.5	1680	38,600
Green Dot	10.0	1275	25,200	12.5	1461	35,000
Herco	12.0	1404	27,000	15.0	1610	37,700



30/40 KRAG

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length ..... 2.314″
Trim-to Length ..... 2.304″
Maximum Overall Length (With Bullet) ..... 3.089″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 7

TEST COMPONENTS

Cases ..... Remington
Primers ..... Remington 9½
Cast Bullet Used ..... *311359 - 120 Gr.
*Gas Check *311466 - 155 Gr.
*311291 - 173 Gr.
*311407 - 183 Gr.
*311290 - 213 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Krag
Barrel Length ..... 22″
Twist ..... 1-10″
Groove Diameter ..... .3095″

NOTE: Excellent accuracy was obtained with cast bullets of 173 grains and heavier. Caution — A good many Krag rifles which we have inspected show cracks around the locking lug on the bolt. Have your rifle inspected by a gunsmith before using it.

120 Gr. (w/Gas Check)
Bullet #311359 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	9.0	1492	13.0	1872
2400	19.0	1782	23.0	2061
IMR4227	20.0	1709	25.0	2061

155 Gr. (w/Gas Check)
Bullet #311466 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	9.0	1381	13.0	1694
2400	19.0	1712	24.0	2036
IMR4227	19.0	1628	24.0	1934
IMR4198	24.0	1818	28.0	2032

173 Gr. (w/Gas Check)
Bullet #311291 (#2 alloy)

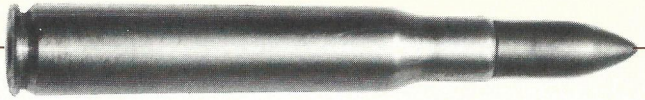
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	8.0	1220	12.0	1562
2400	18.0	1647	23.0	1964
IMR4227	19.0	1633	24.0	1923
IMR4198	23.0	1739	27.0	1980

183 Gr. (w/Gas Check)
Bullet #311407 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	8.0	1204	11.0	1445
2400	17.0	1547	22.0	1854
IMR4227	18.0	1549	23.0	1808
IMR4198	22.0	1700	26.0	1901

213 Gr. (w/Gas Check)
Bullet #311290 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	8.0	1138	11.0	1355
2400	16.0	1415	21.0	1716
IMR4227	17.0	1413	22.0	1689
IMR4198	21.0	1554	25.0	1769



30/06 (7.62 X 63 MM)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length .....2.494″
Trim-to Length .....2.484″
Maximum Overall Length (With Bullet) .....3.340″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS:

Cases .....Winchester
Primers .....Winchester 8½ - 120
Cast Bullets Used .....*311359 - 120 Gr.
*Gas Check *311465 - 125 Gr.
*311440 - 150 Gr.
*311466 - 155 Gr.
*311291 - 173 Gr.
*31141 - 176 Gr.
*311334 - 193 Gr.
*311290 - 213 Gr.
*311284 - 220 Gr.

TEST (Pressure and Velocity) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....26″
Twist .....1-10″
Groove Diameter ..... .308″

NOTE: All loads were held to an extreme velocity spread of 51 F.P.S. Cast bullets No. 311291, No. 31141 and No. 311290 performed outstandingly.

120 Gr. (w/Gas Check)
Bullet #311359 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1610	22,000	14.0	1953	38,100
PB	12.0	1689	27,000	15.5	1941	39,000
SR7625	12.5	1677	21,600	16.5	2008	42,400
Red Dot	11.0	1683	23,400	15.0	2000	36,900
Unique	14.0	1960	27,000	19.0	2331	42,000
Green Dot	13.0	1792	28,800	16.0	2020	38,600
Herco	14.5	1876	28,200	18.0	2132	39,000

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1567	20,400	15.0	1976	42,000
PB	12.0	1639	23,400	15.5	1901	38,600
SR7625	12.5	1661	23,400	16.5	1976	42,900
Red Dot	11.0	1630	22,400	15.0	1953	36,400
Unique	13.0	1824	24,600	18.0	2207	38,100
Green Dot	13.0	1773	31,000	16.0	1984	40,300
Herco	14.5	1848	29,400	18.0	2083	40,700

125 Gr. (w/Gas Check)
Bullet #311465 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1420	25,200	13.5	1691	38,600
PB	11.5	1455	24,600	15.0	1709	40,300
SR7625	12.5	1529	28,800	15.5	1736	39,000
SR4756	13.5	1572	26,400	17.0	1805	36,000
Red Dot	11.0	1497	25,200	14.0	1724	36,400
Unique	12.5	1628	25,800	17.0	1964	38,100
Green Dot	12.0	1545	29,400	15.0	1727	40,900
Herco	13.5	1631	30,000	17.0	1858	39,000

150 Gr. (w/Gas Check)
Bullet #311440 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	10.0	1408	22,800	13.5	1694	37,300
PB	11.5	1449	24,000	15.0	1697	38,600
SR7625	12.5	1512	27,000	15.5	1733	39,400
SR4756	13.5	1572	26,400	17.0	1805	37,300
Red Dot	11.0	1479	24,600	14.0	1715	35,500
Unique	12.5	1636	25,200	17.0	1941	37,300
Green Dot	12.0	1547	29,400	15.0	1748	38,600
Herco	13.5	1618	26,400	17.0	1858	39,400

155 Gr. (w/Gas Check)
Bullet #311466 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	9.5	1307	21,000	13.0	1580	36,400
PB	11.0	1340	21,000	14.5	1595	36,900
SR7625	11.5	1363	23,400	14.5	1585	36,000
SR4756	12.5	1418	22,200	16.5	1692	35,500
Red Dot	10.5	1390	24,000	13.5	1625	35,000
Unique	12.0	1508	24,000	16.5	1842	36,400
2400	20.0	1730	22,200	27.5	2155	33,500
Green Dot	11.5	1436	26,400	14.0	1597	35,500
Herco	12.5	1488	26,400	16.0	1697	35,500

173 Gr. (w/Gas Check)
Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	9.5	1288	22,800	13.0	1545	36,000
PB	11.0	1326	23,400	14.5	1557	37,700
SR7625	11.5	1346	24,000	14.5	1570	36,900
SR4756	12.5	1406	22,800	16.5	1653	36,400
Red Dot	10.5	1355	22,800	13.5	1585	32,500
Unique	12.0	1504	24,000	16.5	1811	35,500
2400	20.0	1751	22,200	27.0	2141	34,500
Green Dot	11.5	1416	25,800	14.0	1582	34,000
Herco	13.0	1497	27,000	16.0	1689	36,000

176 Gr. (w/Gas Check)
Bullet #31141 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	9.5	1236	23,400	13.0	1483	36,400
PB	11.0	1275	26,700	14.5	1499	38,600
SR7625	11.5	1289	25,200	14.5	1488	37,300
SR4756	12.5	1353	25,200	16.5	1595	36,200
IMR4227	20.0	1570	19,000	28.0	1976	29,400
IMR4198	23.0	1653	19,200	31.0	2040	28,800
Red Dot	10.0	1278	22,800	13.5	1514	36,000
Unique	11.5	1404	24,000	16.5	1715	36,000
2400	20.0	1666	25,800	27.0	2040	32,500
Green Dot	11.5	1347	25,800	14.0	1499	35,500
Herco	13.0	1432	28,200	16.0	1607	38,100

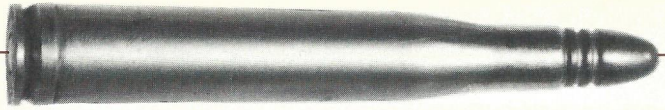
193 Gr. (w/Gas Check)
Bullet #311334 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
700X	9.5	1172	23,800	12.5	1381	35,500
PB	11.0	1218	27,000	14.0	1398	37,300
SR7625	11.5	1246	27,000	14.0	1406	37,300
SR4756	12.5	1307	25,800	16.0	1501	39,900
IMR4227	20.0	1572	24,600	26.5	1865	31,000
IMR4198	24.5	1691	24,000	30.5	2020	33,000
Red Dot	10.0	1215	24,000	13.5	1447	34,500
Unique	11.5	1345	25,800	16.0	1633	36,900
2400	19.0	1562	23,400	26.5	1968	35,000
Green Dot	11.5	1302	28,200	14.0	1443	39,000
Herco	13.0	1379	30,500	16.0	1550	39,000

213 Gr. (w/Gas Check)
Bullet #311290 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
PB	11.0	1194	27,000	14.0	1384	37,000
SR7625	11.5	1242	30,000	13.0	1320	36,400
SR4756	12.5	1264	26,400	15.5	1445	35,000
Red Dot	10.5	1244	27,600	13.5	1418	39,400
Unique	11.5	1326	26,400	15.5	1577	36,400
2400	19.0	1592	27,000	24.0	1827	32,000
Green Dot	11.0	1248	26,400	13.5	1402	36,400
Herco	12.5	1335	30,500	15.5	1510	39,000

220 Gr. (w/Gas Check)
Bullet #311284 (#2 alloy)



.300 H & H MAGNUM (7.63 X 72MM)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length ..... 2.850″
Trim-to Length ..... 2.840″
Maximum Overall Length (With Bullet) ..... 3.655″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Winchester / Western
Primers ..... Winchester 8½ - 120
Cast Bullet Used ..... *311466 - 155 Gr. - 3.345″
*Gas Check *311291 - 173 Gr. - 3.335″
*311334 - 193 Gr. - 3.610″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Remington 721
Barrel Length ..... 26″
Twist ..... 1-10″
Groove Diameter ..... .308″

NOTE: Very uniform velocities and excellent accuracy were the rule throughout our testing of this cartridge. Bullets of 155 grains and 193 grains produced the best results.

155 Gr. (w/Gas Check) Bullet #311466 (#2 alloy)

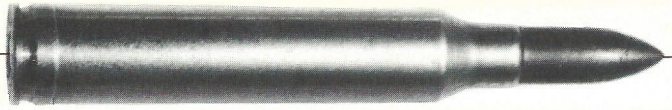
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	12.0	1490	15.0	1695
Green Dot	13.0	1545	16.0	1735
Unique	15.0	1665	18.0	1850
700X	12.0	1495	15.0	1700
PB	13.0	1485	16.5	1710
SR7625	13.5	1500	17.0	1720
230	11.5	1465	15.5	1745
630	18.0	1675	22.0	1900

173 Gr. (w/Gas Check) Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	12.0	1400	15.0	1615
Green Dot	13.0	1445	16.0	1640
Unique	15.0	1570	18.0	1750
700X	12.0	1385	15.0	1590
PB	13.0	1380	16.5	1595
SR7625	13.5	1395	17.0	1620
230	11.5	1370	15.5	1625
630	18.0	1585	22.0	1810

193 Gr. (w/Gas Check) Bullet #311334 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	12.5	1365	15.0	1515
Green Dot	13.5	1420	16.5	1595
Unique	15.5	1505	18.0	1655
700X	12.5	1370	15.0	1525
PB	13.5	1360	16.5	1535
SR7625	14.0	1380	17.0	1550
230	12.0	1345	15.5	1560
630	18.5	1560	22.0	1745



.300 WINCHESTER MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length .....2.620″
Trim-to Length .....2.610″
Maximum Overall Length (With Bullet) .....3.340″
Primer Size .....Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases .....SAKO
Primers .....Winchester 8½ - 120
Cast Bullet Used .....*311440 - 150 Gr. - 3.038″
*Gas Check *311466 - 155 Gr. - 3.185″
*311291 - 173 Gr. - 3.110″
*311467 - 180 Gr. - 3.205″
*311407 - 183 Gr. - 3.240″
*311334 - 193 Gr. - 3.370″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....23″
Twist .....1-10″
Groove Diameter ..... .308″

150 Gr. (w/Gas Check)
Bullet #311440 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	16.0	1720	28,200	19.0	1890	37,700
Green Dot	16.0	1710	25,200	19.0	1885	35,500
Unique	18.0	1810	25,200	22.0	2035	36,900
700X	15.0	1660	28,800	17.0	1770	34,000
PB	15.5	1600	27,000	18.5	1770	35,000
SR7625	16.5	1650	30,000	19.5	1810	37,700
230	15.0	1670	28,200	18.0	1845	36,900
630	21.0	1765	20,400	26.0	2020	27,000

155 Gr. (w/Gas Check)
Bullet #311466 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	16.0	1725	29,400	19.5	1910	39,000
Green Dot	16.0	1700	27,600	19.5	1890	35,500
Unique	18.0	1790	26,400	22.0	2000	35,500
700X	15.0	1660	29,400	18.0	1840	38,600
PB	15.5	1605	26,400	18.5	1765	35,500
SR7625	16.0	1620	28,200	19.0	1785	39,000
230	15.0	1670	27,000	18.0	1830	37,700
630	21.0	1770	21,600	26.0	2040	28,200

173 Gr. (w/Gas Check)
Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	16.0	1640	31,000	19.0	1790	40,700
Green Dot	16.0	1620	30,000	19.0	1775	38,600
Unique	18.0	1705	29,400	22.0	1910	38,600
700X	14.0	1515	28,800	17.0	1690	39,400
PB	15.0	1495	28,200	18.5	1660	36,900
SR7625	15.0	1480	27,600	18.0	1650	36,000
230	14.0	1510	26,400	17.5	1715	34,000
630	21.0	1710	20,400	26.0	1965	27,600

180 Gr. (w/Gas Check)
Bullet #311467 (#2 alloy)

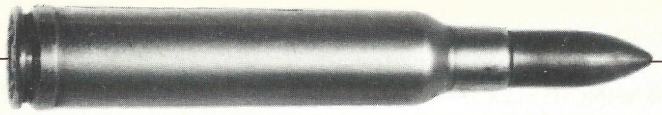
Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	15.0	1565	30,500	18.0	1720	37,300
Green Dot	15.0	1535	25,200	18.5	1720	34,500
Unique	17.5	1650	27,000	21.5	1845	37,300
700X	14.0	1480	25,800	17.0	1640	36,900
PB	15.0	1470	26,400	18.5	1650	37,300
SR7625	15.0	1460	24,600	18.5	1650	36,900
230	14.0	1485	25,800	17.5	1685	33,000
630	21.5	1675	20,400	26.5	1915	23,400

183 Gr. (w/Gas Check)
Bullet #311407 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	15.0	1535	25,800	18.0	1680	35,000
Green Dot	15.0	1520	23,400	18.5	1705	33,000
Unique	17.5	1635	25,800	21.5	1840	31,500
700X	14.0	1470	24,600	17.5	1665	36,400
PB	15.0	1445	25,200	19.0	1655	37,700
SR7625	15.0	1435	26,400	19.0	1650	36,400
230	14.0	1475	22,800	18.0	1700	33,500
630	21.5	1700	20,400	26.5	1925	25,800

193 Gr. (w/Gas Check)
Bullet #311334 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Red Dot	15.0	1495	25,200	18.0	1650	34,000
Green Dot	15.0	1490	24,000	18.5	1665	32,000
Unique	17.5	1605	26,400	22.5	1845	38,600
700X	14.0	1435	25,200	17.5	1620	35,500
PB	15.0	1425	25,200	19.0	1615	36,400
SR7625	15.0	1420	25,200	19.0	1615	36,400
230	14.0	1450	24,000	18.0	1660	34,500
630	21.0	1645	20,400	26.0	1870	24,600



.308 NORMA MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length ..... 2.560″
Trim-to Length ..... 2.550″
Maximum Overall Length (With Bullet) ..... 3.250″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Norma
Primers ..... Remington 9½
Cast Bullets Used ..... *311466 - 155 Gr.
*Gas Check *311291 - 173 Gr.
*311334 - 193 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Schultz & Larsen 65 DL
Barrel Length ..... 24″
Twist ..... 1-10″
Groove Diameter ..... .308″

NOTE: Our test rifle had a considerable amount of free-bore. On custom rifles which are not free-bored, maximum loads should be reduced by a full 5% from those listed. Even with this reduction, such loads should be approached with caution. We suggest that only standard large rifle primers be used with cast bullet loads.

155 Gr. (w/Gas Check) Bullet #311466 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	15.0	1700	18.0	1893
2400	24.0	1845	27.0	2012
IMR4227	24.0	1715	28.0	1949

173 Gr. (w/Gas Check) Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.0	1569	17.0	1763
2400	22.0	1715	26.0	1919
IMR4227	22.0	1600	27.0	1890

193 Gr. (w/Gas Check) Bullet #311334 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.0	1488	16.0	1612
2400	20.0	1552	27.0	1897
IMR4227	20.0	1412	27.0	1792

.300 WEATHERBY MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length ..... 2.825″
Trim-to Length ..... 2.815″
Maximum Overall Length (With Bullet) ..... 3.5625″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Weatherby
Primers ..... Remington 9½
Cast Bullet Used ..... *311291 - 173 Gr.
*Gas Check *311334 - 193 Gr.
*311290 - 213 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Weatherby Mark V
Barrel Length ..... 26″
Twist ..... 1-12″
Groove Diameter ..... .3075″

NOTE: The data listed for this cartridge was obtained in a Weatherby rifle and is intended for Weatherby rifles only. The free-boring constructed into these firearms allow velocities at safe working pressures. For custom rifles which are not free-bored, maximum loads should be reduced a full 5%. Even then, they should be approached with caution.
Use only standard large rifle primers with cast bullet data.

173 Gr. (w/Gas Check) Bullet #311291 (#2 alloy)

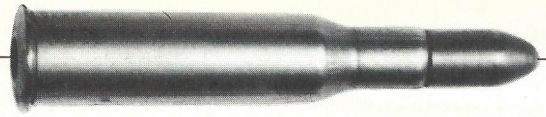
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	15.0	1572	19.0	1818
2400	23.0	1736	28.0	1976

193 Gr. (w/Gas Check) Bullet #311334 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.0	1449	18.0	1680
2400	22.0	1607	27.0	1828

213 Gr. (w/Gas Check) Bullet #311290 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	12.0	1265	16.0	1506
2400	20.0	1474	25.0	1718
IMR4227	31.0	1838	35.0	2000



7.62 RUSSIAN (7.62 X 54 R MM)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .310"*
Maximum Case Length .....2.114"
Trim-to Length .....2.105"
Maximum Overall Length (With Bullet) .....3.037"
Primer Size .....Large Rifle
Lyman Shell Holder Number 17

TEST COMPONENTS

Cases .....Norma
Primers .....Remington 9½
Cast Bullet Used .....*311466 - 155 Gr.
*Gas Check *311291 - 173 Gr.
*311290 - 213 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Westinghouse/Russian
Barrel Length .....24"
Twist .....1-10"
Groove Diameter ..... .310"

NOTE: *Groove and bore dimensions of these Russian Military rifles vary considerably. Most rifles have a groove diameter of .310" and for these we recommend cast bullets of .310" diameter. Due to the limitations of the chamber size, larger bullets are not recommended even in rifles which have groove diameters larger than .310".

155 Gr. (w/Gas Check) Bullet #311466 (#2 alloy)

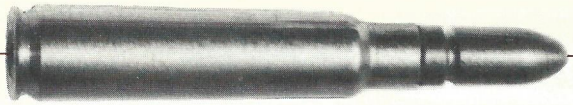
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	12.0	1592	15.0	1827
2400	23.5	1980	27.0	2197

173 Gr. (w/Gas Check) Bullet #311291 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	11.0	1461	14.0	1680
2400	22.0	1865	24.0	1941

213 Gr. (w/Gas Check) Bullet #311290 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	10.0	1261	13.0	1483
2400	17.0	1413	22.0	1754
IMR4227	27.0	1882	30.0	2028



7.65 ARGENTINE MAUSER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .312″
Maximum Case Length ..... 2.105″
Trim-to Length ..... 2.100″
Maximum Overall Length (With Bullet) ..... 2.970″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases ..... Norma
Primers ..... Winchester/Western 8½ - 120
Cast Bullet Used ..... *311466 - 155 Gr. 2.680″
*Gas Check *311299 - 205 Gr. 2.853″
*311284 - 217 Gr. 2.855″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Military Model 91 Mauser
Barrel Length ..... 29¼″
Twist ..... 1 - 9.8″
Groove Diameter ..... .312″

NOTE: A wide variation of groove diameters exits with rifles chambered for this caliber. We recommend that you slug your barrel before reloading. C.B.#311284 gave best results in our test rifle.

155 Gr. (w/Gas Check) Bullet #311466 (#2 alloy)

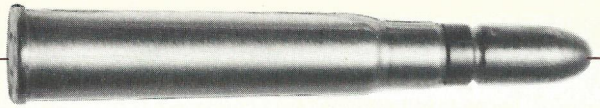
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1475	14.0	1780
Green Dot	11.0	1530	14.5	1795
Unique	12.0	1590	15.0	1820
700X	10.0	1475	14.0	1785
PB	11.0	1470	15.0	1770
SR7625	11.5	1485	15.5	1775
230	10.0	1475	14.0	1795
630	15.0	1600	20.0	1940

205 Gr. (w/Gas Check) Bullet #311299 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.5	1260	12.5	1490
Green Dot	10.0	1295	13.0	1515
Unique	10.0	1285	13.0	1505
700X	9.0	1225	11.0	1380
PB	9.5	1200	12.0	1380
SR7625	10.0	1230	12.5	1405
230	9.0	1245	11.0	1410
630	13.0	1380	18.0	1695

217 Gr. (w/Gas Check) Bullet #311284 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.0	1190	12.0	1415
Green Dot	9.5	1215	12.0	1400
Unique	9.5	1200	13.0	1445
700X	9.0	1190	11.0	1345
PB	9.5	1160	12.0	1340
SR7625	10.0	1195	12.5	1365
230	8.5	1160	11.0	1355
630	13.0	1330	18.0	1645



.303 BRITISH

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .312″
Maximum Case Length ..... 2.222″
Trim-to Length ..... 2.212″
Maximum Overall Length (With Bullet) ..... 3.075″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 7

TEST COMPONENTS

Cases ..... Federal
Primers ..... Federal 210
Cast Bullet Used ..... *311466 - 155 Gr. - 2.788″
*Gas Check *311299 - 205 Gr. - 2.930″
*311284 - 217 Gr. - 3.005″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Martini Single Shot
Barrel Length ..... 22″
Twist ..... 1-10″
Groove Diameter ..... .312″

NOTE: An extreme variation in groove diameters exists in rifles chambered for this cartridge. In rifles which we have checked, diameters range from .309″ to .317″. We suggest that you slug your barrel before reloading. Cast bullets should be sized as near groove diameter as possible.

155 Gr. (w/Gas Check) Bullet #311466 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1430	13.5	1695
Green Dot	10.5	1460	14.0	1715
Unique	11.0	1475	15.0	1760
700X	10.0	1445	13.0	1660
PB	10.5	1410	13.0	1585
SR7625	11.0	1425	13.5	1610
230	10.0	1445	13.0	1660

205 Gr. (w/Gas Check) Bullet #311299 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1290	13.0	1490
Green Dot	10.0	1280	13.5	1515
Unique	10.5	1295	14.0	1530
700X	9.5	1240	12.5	1460
PB	10.0	1220	12.5	1390
SR7625	10.5	1250	12.5	1380
230	9.5	1255	12.5	1465

217 Gr. (w/Gas Check) Bullet #311284 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1245	12.5	1415
Green Dot	9.5	1190	13.0	1425
Unique	10.0	1210	13.5	1450
700X	9.0	1165	12.0	1375
PB	9.5	1130	12.0	1310
SR7625	10.0	1170	12.0	1300
230	9.0	1165	12.0	1385

7.7 JAPANESE

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .312″
Maximum Case Length ..... 2.269″
Trim-to Length ..... 2.260″
Maximum Overall Length (With Bullet) ..... 3.150″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases ..... Norma
Primers ..... Remington 9½
Cast Bullet Used ..... *311466 - 155 Gr. - 2.884″
*Gas Check *311299 - 205 Gr. - 3.005″
*311284 - 217 Gr. - 3.005″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Japanese Arisaka
Barrel Length ..... 22″
Twist ..... 1-9.75″
Groove Diameter ..... .312″

NOTE: An extreme variation in groove diameters exists in rifles chambered for this cartridge. In rifles which we have checked, diameters range from .310″ to .317″. We suggest that you slug your barrel before reloading.
Due to wide variations in bullet and groove diameters, utmost care should be used when working up loads.
Cast bullets should be sized as close to groove diameter as possible.

155 Gr. (w/Gas Check) Bullet #311466 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1331	12.0	1513
Unique	11.0	1424	15.0	1706
2400	22.0	1615	24.0	1801
700X	9.5	1324	11.5	1466
PB	10.5	1235	13.0	1481
IMR4227	28.0	1838	30.0	1976

205 Gr. (w/Gas Check) Bullet #311299 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1185	12.0	1316
Unique	10.0	1223	14.0	1449
2400	21.0	1549	24.0	1763
700X	9.5	1176	11.5	1290
PB	10.5	1166	12.5	1329
IMR4227	28.0	1805	30.0	1923

217 Gr. (w/Gas Check) Bullet #311284

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1183	12.0	1308
Unique	10.0	1158	13.0	1438
2400	21.0	1538	24.0	1751
700X	9.5	1123	11.5	1274
PB	10.5	1142	12.5	1268
IMR4227	28.0	1760	30.0	1869

32/20 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .313″
Maximum Case Length .....1.315″
Trim-to Length .....1.305″
Maximum Overall Length (With Bullet) .....1.592″
Primer Size .....Small Rifle
Lyman Shell Holder Number 10

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester 6½ - 116
Cast Bullet Used .....*311419 - 91 Gr. - 1.570″
*Gas Check *311316 - 115 Gr. - 1.555″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Marlin 27S
Barrel Length .....24″
Twist .....1-22″
Groove Diameter ..... .313″

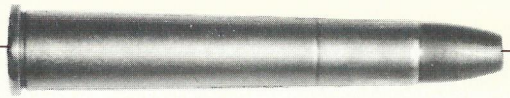
NOTE: Do not use these loads in rifles which were designed for Black Powder or in Handguns.
Some cartridge cases may be encountered which are actually shorter than the listed "Trim-to-length." This will cause no problems in your loading, but such cases for this cartridge should be segregated according to length because of the different adjustments which will be necessary in your bullet seating die.
Some small variations in groove diameter exist in rifles chambered for this cartridge. It is advisable to slug your barrel and size cast bullets accordingly.

91 Gr. (w/Gas Check)
Bullet #311419 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.5	1135	4.5	1355
Green Dot	3.8	1165	4.8	1380
Unique	4.5	1185	6.0	1550
700X	3.0	1040	4.2	1340
PB	3.5	1050	5.2	1430
SR7625	3.8	1085	5.8	1515
230	3.0	1055	4.5	1400

115 Gr. (w/Gas Check)
Bullet #311316 (#2 alloy)

Powder	Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.2	1030	4.1	1215
Green Dot	3.5	1045	4.5	1255
Unique	4.2	1110	5.5	1390
700X	2.8	940	3.9	1195
PB	3.2	955	4.9	1295
SR7625	3.5	985	5.5	1380
230	3.0	980	4.0	1205



32/40 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .322″
Maximum Case Length ..... 2.130″
Trim-to-Length ..... 2.120″
Maximum Overall Length (With Bullet) ..... 2.500″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 6

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 9½
Cast Bullet Used ..... *321317 - 164 Gr. - 2.585″
*Gas Check *321297 - 184 Gr. - 2.570″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Winchester Hi-Wall
Barrel Length ..... 30″
Twist ..... 1-16″
Groove Diameter ..... .322″

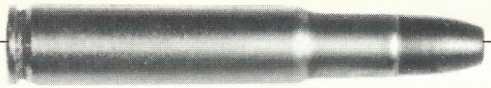
NOTE: Bullets seated past max. OAL. Should be 2.500 or less in rifles w/tubular magazine.
Use only blunt or round nose bullets in rifles which have tubular magazines and crimp the bullets to prevent their movement.

164 Gr. (w/Gas Check)
Bullet #321317 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	5.0	1015	7.5	1290
Green Dot	5.5	1070	8.0	1305
Unique	6.0	1080	8.5	1315
700X	5.0	1010	7.5	1280
PB	5.5	1000	8.5	1290
230	5.0	1015	7.5	1275

184 Gr. (w/Gas Check)
Bullet #321297 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	4.8	825	7.3	1195
Green Dot	5.3	980	7.8	1225
Unique	5.6	980	8.3	1240
700X	4.8	790	7.3	1190
PB	5.3	910	8.3	1220
230	4.8	815	7.3	1200



32 REMINGTON

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .319″ to .321″
Maximum Case Length .....2.050″
Trim-to Length .....2.045″
Maximum Overall Length (With Bullet) .....2.525″
Primer Size .....Large Rifle
Lyman Shell Holder Number .....15 or 3

TEST COMPONENTS

Cases .....Remington
Primers .....Remington 9½
Cast Bullet Used .....*321317 - 164 Gr.
*Gas Check *321297 - 184 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Remington 81
Barrel Length .....22″
Twist .....1-14″
Groove Diameter ..... .319″

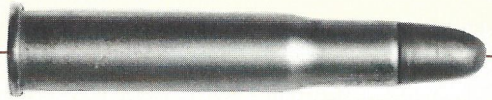
NOTE: New brass cases which exceed the maximum case length listed may be encountered. We suggest that you check your case length before reloading and trim your case if necessary.
The Lyman No. 15 Shell Holder is proper for all cases with the exception of Remington brand. For Remington and Peters cases use the Lyman No. 3 Shell Holder.
Data listed for Unique powder will not function the action of semi-auto rifles.

164 Gr. (w/Gas Check)
Bullet #321317 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	7.0	1234	12.0	1720
2400	18.0	1798	21.0	2012

184 Gr. (w/Gas Check)
Bullet #321297 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	7.0	1159	9.0	1369
2400	16.0	1552	19.0	1788



.32 WINCHESTER SPECIAL

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .321″
Maximum Case Length ..... 2.040″
Trim to Length ..... 2.035″
Maximum Overall Length (With Bullet) ..... 2.565″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 6

TEST COMPONENTS

Cases ..... Federal
Primers ..... Federal 210
Cast Bullet Used ..... *321427 - 137 Gr. 2.362″
*Gas Check *321317 - 164 Gr. 2.471″
*321297 - 184 Gr. 2.550″

TEST (Velocity) SPECIFICATIONS

Firearms Used ..... Winchester Model 94
Barrel Length ..... 20″
Twist ..... 1 - 16″
Groove Diameter ..... .321″

137 Gr. (w/Gas Check) Bullet #321427 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	8.0	1410	11.0	1710
Green Dot	8.5	1420	11.5	1710
Unique	8.5	1445	11.5	1760
Herco	10.0	1495	12.5	1730
700X	7.5	1380	10.0	1640
PB	8.0	1325	10.5	1575
SR7625	8.0	1300	10.5	1570
SR4756	9.0	1345	12.0	1645

164 Gr. (w/Gas Check) Bullet #321317 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.5	1265	10.5	1540
Green Dot	8.0	1270	11.0	1555
Unique	8.0	1295	11.0	1590
Herco	9.5	1340	12.0	1570
700X	7.2	1235	9.7	1480
PB	7.7	1185	10.2	1430
SR7625	7.5	1160	10.0	1415
SR4756	8.7	1230	11.5	1495

184 Gr. (w/Gas Check) Bullet #321297 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1155	10.0	1420
Green Dot	7.5	1170	10.5	1440
Unique	7.5	1195	10.5	1485
Herco	9.0	1265	11.5	1480
700X	6.7	1135	9.0	1340
PB	7.2	1100	9.7	1320
SR7625	7.5	1120	9.5	1295
SR4756	8.2	1140	11.0	1395

8 X 57 MAUSER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .323″
Maximum Case Length ..... 2.240″
Trim-to-Length ..... 2.235″
Maximum Overall Length (With Bullet) ..... 3.250″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases ..... Federal
Primers ..... Federal 210
Cast Bullet Used — 32359 - 115 Gr. 2.563″
*Gas Check — *323470 - 168 Gr. 2.730″
*323366 - 185 Gr. 3.010″
*323471 - 218 Gr., 3.000″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Czech BRNO Mauser
Barrel Length ..... 24″
Twist ..... 1-9¼″
Groove Diameter ..... .326″

NOTE: Before loading for this cartridge, we recommend that you slug your barrel. For non-standard (small groove diameter) barrels, we suggest the use of lead alloy bullets sized as near to the exact groove diameter as possible.This data is not for use in .318 diameter barrels.

115 Gr. Bullet #32359 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	11.0	1690	15.0	2015
Green Dot	12.0	1745	16.0	2045
Unique	14.0	1855	18.0	2150
700X	11.0	1690	15.0	2000
PB	12.5	1700	16.5	1995
SR7625	13.0	1715	17.5	2050
230	11.0	1675	15.0	2005
630	17.0	1740	23.0	2120

168 Gr.(w/Gas Check) Bullet #323470 (#2 alloy)

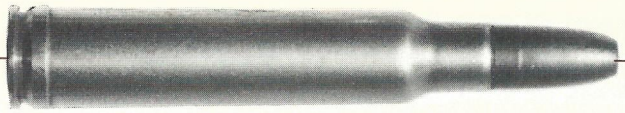
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1355	14.0	1645
Green Dot	11.0	1405	15.0	1710
Unique	13.0	1545	17.0	1820
700X	10.0	1360	14.0	1655
PB	11.5	1385	15.5	1670
SR7625	12.0	1410	16.5	1725
230	10.0	1360	14.0	1655
630	16.0	1540	22.0	1895

185 Gr.(w/Gas Check) Bullet #323366 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1315	14.0	1580
Green Dot	11.0	1365	15.0	1620
Unique	13.0	1490	17.0	1705
700X	10.0	1300	14.0	1570
PB	11.5	1335	15.0	1565
SR7625	12.0	1360	16.0	1610
230	10.0	1305	14.0	1570
630	16.0	1495	22.0	1795

218 Gr.(w/Gas Check) Bullet #323471 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1205	13.0	1410
Green Dot	11.0	1260	14.0	1465
Unique	13.0	1385	16.0	1580
700X	10.0	1215	13.0	1420
PB	11.5	1245	14.0	1405
SR7625	12.0	1280	15.0	1460
230	10.0	1220	13.0	1435
630	16.0	1425	21.0	1705



.338 WINCHESTER MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .338″
Maximum Case Length ..... 2.500″
Trim-to-Length ..... 2.490″
Maximum Overall Length (With Bullet) ..... 3.340″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Winchester/Western
Primers ..... Winchester 8½ - 120
Cast Bullet Used ..... *338320 - 203 Gr. - 3.150″
*Gas Checked *33889 - 249 Gr. - 3.271″

TEST (Velocity) SPECIFICATIONS

Firearms Used ..... Winchester Model 70
Barrel Length ..... 24″
Twist ..... 1-10″
Groove Diameter ..... .336″

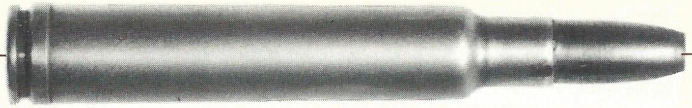
NOTE: Fine accuracy and uniform velocities were turned in with all of the powders and bullets tested.
Cast bullet loadings should be used with standard large rifle primers only.

203 Gr. (w/Gas Check)
Bullet #338320 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	12.0	1320	16.0	1575
Green Dot	13.0	1360	17.0	1615
Unique	14.0	1400	19.5	1705
700X	12.0	1320	16.0	1580
PB	13.0	1300	18.0	1590
SR7625	14.0	1340	20.0	1710
230	12.0	1325	16.0	1590
630	19.0	1500	25.0	1840

249 Gr. (w/Gas Check)
Bullet #33889 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	11.5	1150	15.5	1390
Green Dot	13.0	1210	16.5	1420
Unique	14.0	1245	19.0	1510
700X	12.0	1180	15.5	1390
PB	13.0	1155	17.5	1395
SR7625	14.0	1190	19.5	1465
230	12.0	1190	15.5	1400
630	18.5	1355	24.5	1615



.340 WEATHERBY MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .338″
Maximum Case Length .....2.825″
Trim-to Length .....2.815″
Maximum Overall Length (With Bullet) .....3.5625″
Primer Size .....Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases .....Weatherby
Primers .....Remington 9½
Cast Bullet Used .....*338320 - 203 Gr.
*Gas Check *33889 - 249 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Weatherby Mark V
Barrel Length .....26″
Twist .....1-10″
Groove Diameter ..... .338″

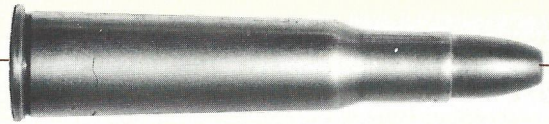
NOTE: The data listed for this cartridge was obtained in a Weatherby rifle and is intended for Weatherby rifles only. The free-boring constructed into these firearms allow higher velocities at safe working pressures. For custom rifles which are not free-bored, maximum loads should be reduced a full 5%. Even then, they should be approached with caution.
Use only standard large rifle primers with cast bullets.

203 Gr. (w/Gas Check)
Bullet #338320 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
IMR4198	32.0	1782	38.0	2044
IMR3031	40.0	1949	44.0	2100
IMR4895	42.0	1930	48.0	2109

249 Gr. (w/Gas Check)
Bullet #33889 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
IMR4198	25.0	1442	37.0	1923
IMR3031	39.0	1768	43.0	1962
IMR4895	41.0	1811	47.0	2024



.348 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .348″
Maximum Case Length ..... 2.255″
Trim-to Length ..... 2.245″
Maximum Overall Length (With Bullet) ..... 2.795″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 18

TEST COMPONENTS

Cases ..... Remington
Primers ..... Remington 9½
Cast Bullet Used ..... *350447 - 187 Gr.
*Gas Check *350482 - 255 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Winchester 71
Barrel Length ..... 24″
Twist ..... 1-12″
Groove Diameter ..... .3485″

NOTE: Only blunt, or round nose bullets should be used in these rifles which have tubular magazines. Bullets should also be crimped in place to prevent their movement during recoil.

187 Gr. (w/Gas Check)
Bullet #350447 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	20.0	1610	23.0	1779
IMR4227	20.0	1510	30.5	2123
IMR4198	25.0	1672	35.0	2150
IMR3031	35.0	1818	47.0	2338

255 Gr. (w/Gas Check)
Bullet #350482 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
2400	19.0	1412	22.0	1560
IMR4227	21.0	1428	30.0	1838
IMR4198	27.0	1661	38.5	2096
IMR3031	35.0	1798	46.0	2217

.351 WINCHESTER Self-Loading

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .352″
Maximum Case Length .....1.380″
Trim-to Length .....1.376″
Maximum Overall Length (With Bullet) .....1.900″
Primer Size .....Small Rifle
Lyman Shell Holder Number 15

TEST COMPONENTS

Cases .....Winchester
Primers .....Remington 6½
Cast Bullet Used .....*350319 - 171 Gr.
*Gas Check

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Winchester 07
Barrel Length .....20″
Twist .....1-16″
Groove Diameter ..... .351″

NOTE: To insure positive functioning of the action, loads must be worked up to near maximum.
348 caliber gas checks are used with cast bullets for this cartridge. Best overall results were obtained with I.M.R. 4227 powder.

171 Gr. (w/Gas Check)
Bullet #350319 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	12.0	1692	12.5	1751
2400	17.0	1861	19.0*	2020
IMR4227	17.0	1658	19.5*	1904

*Compressed Powder Charge

.35 REMINGTON

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .357″
Maximum Case Length ..... 1.920″
Trim-to-Length ..... 1.910″
Maximum Overall Length (With Bullet) ..... 2.525″
Primer Size ..... Large Rifle
Lyman Shell Holder Number ..... 8 & 2

TEST COMPONENTS

Cases ..... Winchester/Western
Primers ..... Winchester 8½ - 120
Cast Bullet Used ..... 358430 - 150 Gr. 2.215″
*Gas Check 358430 - 195 Gr. 2.215″
*358315 - 206 Gr. 2.500″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Marlin 336
Barrel Length ..... 20″
Twist ..... 1-16″
Groove Diameter ..... .357″

NOTE: Bullets should be sized to the exact groove diameter. If the rifle has multi or shallow groove rifling, then cast bullet velocities must be held to 1600 F.P.S. or less, if accuracy is to be obtained.
Use only blunt, or round nose bullets, in those rifles which have tubular magazines. Bullets are best crimped in place to prevent their moving with recoil.
The No. 8 Lyman Shell Holder works on all brass with the exception of Remington and Peters brand which requires a No. 2.

150 Gr.
Bullet #358430 (#2 alloy)

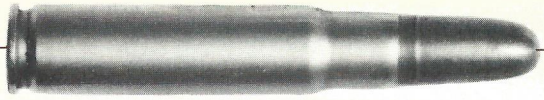
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	8.5	1390	11.0	1615
Green Dot	9.0	1395	11.5	1625
Unique	9.5	1370	12.5	1665
Herco	10.5	1425	13.5	1675
700X	8.0	1360	10.0	1545
PB	8.5	1310	11.5	1570
SR7625	9.0	1330	11.5	1555
SR4756	10.0	1355	13.0	1590
630	12.5	1340	16.0	1595

195 Gr.
Bullet #358430 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	8.5	1280	11.0	1495
Green Dot	9.0	1300	11.5	1515
Unique	9.5	1320	12.0	1525
Herco	10.5	1360	13.0	1550
700X	8.0	1255	10.0	1415
PB	8.5	1225	11.5	1470
SR7625	9.0	1230	11.5	1450
SR4756	10.0	1275	13.0	1515
630	12.5	1320	16.0	1555

206 Gr.(w/Gas Check)
Bullet #358315 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	8.5	1240	11.0	1440
Green Dot	9.0	1260	11.5	1455
Unique	9.5	1265	12.0	1465
Herco	10.5	1315	13.0	1490
700X	8.0	1200	10.0	1370
PB	8.5	1170	11.5	1405
SR7625	9.0	1185	11.5	1390
SR4756	10.0	1235	13.0	1445
630	12.5	1265	16.0	1505



.358 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .359″
Maximum Case Length .....2.015″
Trim-to-Length .....2.005″
Maximum Overall Length (With Bullet) .....2.780″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester 8½ - 120
Cast Bullet Used .....358430 - 150 Gr. - 2.295″
*Gas Check *358315 - 206 Gr. - 2.585″
*358318 - 247 Gr. - 2.745″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Mannlicher-Schoenauer
Barrel Length .....20″
Twist .....1-12″
Groove Diameter ..... .362″

NOTE: Accuracy was less than expected due to large groove diameter on test rifle.

150 Gr.
Bullet #358430 (#2 alloy)

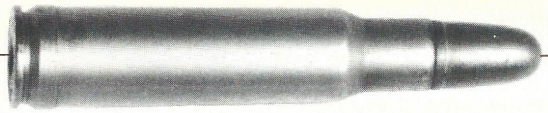
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.5	1425	13.5	1745
Green Dot	10.5	1545	14.0	1765
Unique	11.5	1570	15.0	1795
700X	9.5	1425	13.5	1745
PB	10.5	1500	14.0	1730
SR7625	11.5	1565	14.5	1755
230	9.5	1455	13.5	1805
630	14.5	1455	21.0	1930

206 Gr. (w/Gas Check)
Bullet #358315 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.0	1190	13.0	1505
Green Dot	10.0	1310	13.0	1495
Unique	11.0	1340	14.5	1550
700X	9.0	1205	12.5	1490
PB	10.0	1265	13.5	1465
SR7625	11.0	1295	14.0	1480
230	9.0	1200	12.5	1500
630	14.0	1270	20.0	1700

247 Gr. (w/Gas Check)
Bullet #358318 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.0	1100	12.5	1355
Green Dot	9.5	1115	12.5	1340
Unique	10.5	1205	14.0	1395
700X	9.0	1095	12.0	1330
PB	9.5	1070	13.0	1310
SR7625	10.5	1170	13.5	1325
230	9.0	1100	12.0	1330
630	13.5	1200	19.0	1515



.350 REMINGTON MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .358″
Maximum Case Length ..... 2.170″
Trim-to Length ..... 2.160″
Maximum Overall Length (With Bullet) ..... 2.800″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 9½
Cast Bullet Used ..... 358430 - 150 Gr. - 2.450″
*Gas Check *358315 - 206 Gr. - 2.760″
*358318 - 247 Gr. - 2.800″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Remington 700
Barrel Length ..... 24″
Twist ..... 1-16″
Groove Diameter ..... .358″

150 Gr.
Bullet #358430 (#2 alloy)

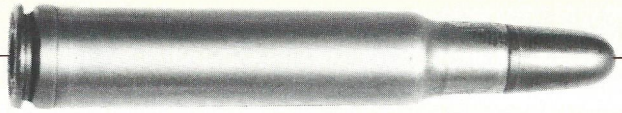
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1430	15.0	1810
Green Dot	11.0	1475	16.0	1840
Unique	12.0	1495	17.5	1880
700X	10.0	1430	15.0	1800
PB	11.0	1390	16.5	1805
SR7625	12.0	1445	17.5	1830
230	10.0	1435	15.0	1820

206 Gr. (w/Gas Check)
Bullet #358315 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1270	14.5	1535
Green Dot	11.0	1315	15.5	1620
Unique	12.0	1345	17.0	1675
700X	10.0	1280	14.5	1540
PB	11.0	1250	16.0	1580
SR7625	12.0	1305	17.0	1615
230	10.0	1280	14.5	1540

247 Gr. (w/Gas Check)
Bullet #358318 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	9.5	1075	14.0	1385
Green Dot	10.5	1185	15.0	1470
Unique	11.5	1225	16.5	1530
700X	9.5	1085	14.0	1400
PB	10.5	1130	15.5	1430
SR7625	11.5	1170	16.5	1470
230	9.5	1095	14.0	1400



.358 NORMA MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .358″
Maximum Case Length ..... 2.515″
Trim-to Length ..... 2.505″
Maximum Overall Length (With Bullet) ..... 3.270″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Norma
Primers ..... Remington 9½
Cast Bullet Used ..... *358315 - 206 Gr.
*Gas Check *358318 - 247 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Schultz & Larsen
Barrel Length ..... 24″
Twist ..... 1-12″
Groove Diameter ..... .358″

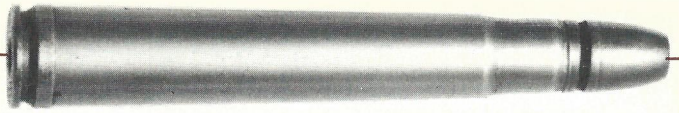
NOTE: Our test rifle had a considerable amount of free-bore. On custom rifles which are not free-bored, maximum loads should be reduced by a full 5% from those listed. Even with this reduction, such loads should be approached with caution. We suggest that only standard large rifle primers be used with cast bullet loads.

206 Gr. (w/Gas Check)
Bullet #358315 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	16.0	1604	21.0	1865

247 Gr. (w/Gas Check)
Bullet #358318 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	15.0	1436	19.0	1658



.375 H & H MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .375″
Maximum Case Length ..... 2.850″
Trim-to-Length ..... 2.840″
Maximum Overall Length (With Bullet) ..... 3.600″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases ..... Winchester/Western
Primers ..... Winchester 8½ - 120
Cast Bullet Used ..... 375248 - 249 Gr. 3.395″
*Gas Check *375296 - 269 Gr. 3.400″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Winchester Model 70
Barrel Length ..... 24″
Twist ..... 1-12″
Groove Diameter ..... .376″

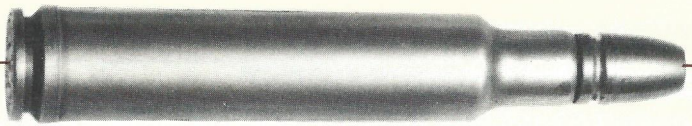
NOTE: For cast bullet loads, use only standard large rifle primers. Due to heavy recoil we recommend that all hunting loads be crimped to prevent the bullet from moving. 375296 gave best results with all powders.

249 Gr.
Bullet #375248 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.5	1150	15.0	1420
Green Dot	11.5	1195	16.0	1450
Unique	13.0	1260	18.0	1525
Herco	15.0	1335	20.0	1590
Blue Dot	17.0	1395	24.5	1750
700X	10.0	1115	15.0	1410
PB	11.0	1105	16.0	1380
SR4756	18.0	1430	24.5	1720
230	10.5	1145	15.0	1415
630	20.0	1415	26.0	1710

269 Gr. (w/Gas Check)
Bullet #375296 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.5	1115	14.5	1335
Green Dot	11.5	1165	15.5	1370
Unique	13.0	1220	17.5	1460
Herco	15.0	1295	19.5	1515
Blue Dot	17.0	1355	23.5	1645
700X	10.5	1110	14.5	1335
PB	11.0	1075	15.5	1330
SR4756	17.0	1350	23.5	1640
230	10.5	1110	14.5	1335
630	19.0	1345	25.0	1620



.378 WEATHERBY MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .375″
Maximum Case Length ..... 2.913″
Trim-to Length ..... 2.903″
Maximum Overall Length (With Bullet) ..... 3.690″
Primer Size ..... Large Rifle*
Lyman Shell Holder Number 17

TEST COMPONENTS

Cases ..... Weatherby
Primers ..... Remington 9½
Cast Bullet Used ..... 375248 - 249 Gr.
*Gas Check *375449 - 267 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Weatherby Mark V
Barrel Length ..... 26″
Twist ..... 1-12″
Groove Diameter ..... .375″

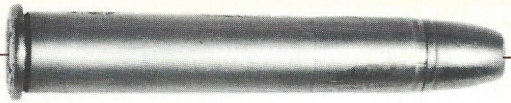
NOTE: The data listed for this cartridge was obtained in a Weatherby rifle and is intended for Weatherby rifles only. The free-boring constructed into these firearms allow higher velocities at safe working pressures. For custom rifles which are not free-bored, maximum loads should be reduced a full 5%. Even then, they should be approached with caution.
Do not use the magnum primers with cast bullet data.
Due to heavy recoil we recommend that all bullets be crimped in place.

249 Gr.
Bullet #375248 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	25.0	1760	29.0	1904

267 Gr. (w/Gas Check)
Bullet #375449 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	24.0	1685	28.0	1831



38/55 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .379″
Maximum Case Length .....2.1285″
Trim-to-Length .....2.118″
Maximum Overall Length (With Bullet) .....2.550″
Primer Size .....Large Rifle
Lyman Shell Holder Number 6

TEST COMPONENTS

Cases .....Remington Peters
Primers .....Remington 9½
Cast Bullet Used .....375248 - 249 Gr. - 2.550″
*Gas Check *375296 - 269 Gr. - 2.550″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Stevens 44½
Barrel Length .....29″
Twist .....1-18″
Groove Diameter ..... .379″

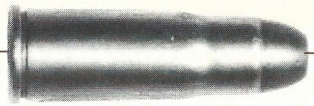
NOTE: Most of the rifles of this caliber which we have encountered show signs of excessive headspace. It is recommended that the rifle be checked by a competent gunsmith before reloading is attempted.
Slight variations in groove diameter do exist in these rifles. Where the groove diameter measures larger than .377″ the exclusive use of cast bullets is recommended for best accuracy.

249 Gr.
Bullet #375248 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.0	945	8.5	1145
Green Dot	6.5	970	9.0	1160
Unique	7.0	975	9.5	1170
700X	6.0	950	8.5	1150
PB	6.5	910	9.5	1140
230	6.0	945	8.5	1150

269 Gr. (w/Gas Check)
Bullet #375296 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.0	910	8.0	1065
Green Dot	6.5	940	8.5	1080
Unique	7.0	935	9.0	1080
700X	6.0	910	8.0	1060
PB	6.5	880	9.0	1065
230	6.0	915	8.0	1065



38/40 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .400″
Maximum Case Length ..... 1.305″
Trim-to-Length ..... 1.300″
Maximum Overall Length (With Bullet) ..... 1.592″
Primer Size ..... Large Pistol
Lyman Shell Holder Number 14B

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 2½
Cast Bullet Used ..... 40188 - 170 Gr. 1.592″
40143 - 172 Gr. 1.550″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Winchester Model 92
Barrel Length ..... 24″
Twist ..... 1-36″
Groove Diameter ..... .400″

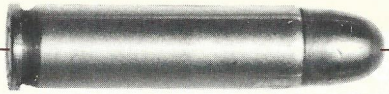
NOTE: These loads should not be used in handguns, or in rifles which were designed for black powder.
Individual tolerances vary greatly in rifles chambered for this cartridge. Therefore extreme care should be used in working up maximum loads.

170 Gr.
Bullet #40188 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	5.5	1070	9.0	1465
Green Dot	6.0	1100	9.5	1470
Unique	7.0	1120	10.5	1515
700X	5.5	1075	9.0	1480
PB	7.0	1130	10.0	1485
SR7625	8.0	1220	11.0	1565
230	5.5	1080	9.0	1485

172 Gr.
Bullet #40143 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	5.5	1080	9.0	1485
Green Dot	6.0	1090	9.5	1480
Unique	7.0	1115	10.5	1515
700X	5.5	1085	9.0	1505
PB	7.0	1155	10.0	1510
SR7625	8.0	1210	11.0	1560
230	5.5	1090	9.0	1495



.401 WINCHESTER Self-Loading

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .406″ to .407″
Maximum Case Length .....1.500″
Trim-to Length .....1.495″
Maximum Overall Length (With Bullet) .....2.005″
Primer Size .....Large Rifle
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Remington
Primers .....Remington 9½
Cast Bullet Used .....41028 - 212 Gr.
410426 - 240 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Winchester 10
Barrel Length .....20″
Twist .....1-14″
Groove Diameter ..... .4075″

NOTE: cases for this cartridge are often quite old and it is recommended that you keep your loads on the light side to avoid trouble with poor brass. Many cases are found which exceed the maximum length listed. Check your case length carefully and trim the cases if necessary. Our best test results were obtained with I.M.R. 4227 powder.

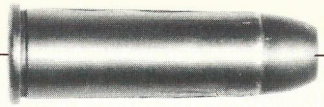
212 Gr.
Bullet #41028 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	12.0	1618	14.9	1845
2400	21.0	1773	23.5	1960
IMR4227	26.0	1915	29.0*	2074

240 Gr.
Bullet #410426 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	11.0	1470	13.7	1672
2400	20.0	1669	22.0	1818
IMR4227	24.0	1506	27.5*	1968

* Designates compressed powder charge



44/40 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .430″
Maximum Case Length ..... 1.305″
Trim-to-Length ..... 1.300″
Maximum Overall Length (With Bullet) ..... 1.592″
Primer Size ..... Large Pistol
Lyman Shell Holder Number 14B

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 2½
Cast Bullet Used ..... 42798 - 205 Gr. 1.580″
*Gas Check *429434 - 220 Gr. 1.580″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Marlin Model 94
Barrel Length ..... 24″
Twist ..... 1-36″
Groove Diameter ..... .436″

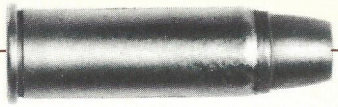
NOTE: These loads should not be used in handguns or in rifles which were designed for black powder.
Individual tolerances vary greatly in rifles chambered for this cartridge. Therefore, extreme care should be used in working up maximum loads.
Due to variations in groove diameters, it is recommended that you slug your barrel before reloading.

205 Gr.
Bullet #42798 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	7.0	1130	8.0	1255
Green Dot	7.3	1125	8.3	1230
Unique	8.0	1090	10.5	1355
700X	7.0	1165	8.0	1270
PB	7.5	1075	9.0	1260
SR7625	8.0	1090	9.5	1285
230	7.0	1160	8.0	1265

215 Gr. (w/Gas Check)
Bullet #429434 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	6.8	1115	7.8	1210
Green Dot	7.1	1100	8.0	1185
Unique	8.0	1100	10.2	1335
700X	6.8	1125	7.8	1225
PB	7.3	1060	8.6	1215
SR7625	7.8	1065	9.0	1210
230	6.8	1130	7.8	1225



.44 REMINGTON MAGNUM (Rifle)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .429″
Maximum Case Length ..... 1.285″
Trim-to-Length ..... 1.280″
Maximum Overall Length (With Bullet) ..... 1.610″
Primer Size ..... Large Pistol
Lyman Shell Holder Number 7

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington Peters 2½
Cast Bullet Used ..... 429348 - 180 Gr. - 1.420″
*Gas Check — *429303 - 205 Gr. - 1.716″; *429215 - 215 Gr. - 1.645″; 429360 - 232 Gr. - 1.655″; 429421 - 245 Gr. - 1.710″; *429244 - 250 Gr. - 1.680″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Ruger .44 Carbine
Barrel Length ..... 18½″
Twist ..... 1-38″
Groove Diameter ..... .429″
Bullet #429303 Not for use in tubular magazines.

NOTE: Cast bullets tend to foul the gas piston and create accuracy problems in semi-automatic rifles when not cleaned regularly. Be certain that your primers are seated correctly. A high primer can fire the cartridge before the bolt is in locked position on the Ruger Carbine.

In rifles with multi or shallow groove rifling cast bullet velocity should be held to 1600 F.P.S., or less, for best accuracy.

In order to correctly seat cast bullets, the maximum overall length as listed, must be exceeded. Check overall length as listed for each specific cast bullet.

180 Gr.
Bullet #429348 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	5.0	965	7.5	1285
Unique	8.0	1185	13.5	1770
Herco	11.0	1420	15.5	1750
Blue Dot	14.0	1440	21.0	1905
2400	18.0	1400	24.0	1835
SR4756	12.0	1485	17.0	1890
IMR4227	19.0	1212	27.0	1820
630	15.0	1415	21.5	1840
AL-7	12.0	1355	19.0	1870
AL-8	14.0	1305	20.0 C	1755

205 Gr. (w/Gas Check)
Bullet #429303 (#2 alloy)
NOT FOR USE IN TUBULAR MAGAZINE

Powder	Sug. Sart Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	5.0	979	7.5	1273
Unique	8.0	1207	13.5	1659
Herco	11.0	1415	15.5	1762
Blue Dot	14.0	1458	19.5	1907
2400	18.0	1404	24.0	1841
SR4756	12.0	1481	16.0	1772
IMR4227	19.0	1291	26.0	1763
630	15.0	1395	20.5	1745
AL-7	12.0	1355	19.0	1855
AL-8	14.0	1290	20.0 C	1720

 C Designates compressed powder charge

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	5.0	935	7.5	1210
Unique	8.5	1205	12.5	1595
Herco	11.0	1365	15.5	1685
Blue Dot	14.0	1370	19.5	1825
2400	18.0	1365	23.5	1735
SR4756	12.0	1425	15.0	1660
IMR4227	20.0	1265	25.5	1695
630	15.0	1320	20.5	1675
AL-7	13.0	1375	18.5	1770
AL-8	14.5	1335	20.0 C	1656

215 Gr. (w/Gas Check)
Bullet #429215 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	5.0	935	7.5	1185
Unique	8.5	1200	12.5	1565
Herco	11.0	1365	15.0	1630
Blue Dot	14.0	1415	18.5	1740
2400	18.0	1370	23.0	1715
SR4756	11.5	1390	14.0	1550
IMR4227	20.0	1275	24.5	1605
630	15.0	1355	19.5	1620
AL-7	13.0	1385	17.5	1685
AL-8	14.5	1300	20.0	1670

232 Gr.
Bullet #429360 (#2 alloy)

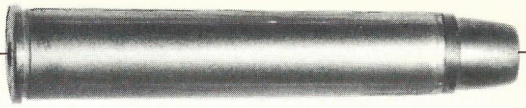
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	5.0	915	7.5	1180
Unique	8.5	1195	12.0	1495
Herco	11.0	1345	14.5	1565
Blue Dot	14.0	1410	17.5	1665
2400	18.0	1375	22.5	1680
SR4756	11.0	1305	13.0	1470
IMR4227	20.0	1310	24.0	1610
630	15.0	1340	19.5	1610
AL-7	13.0	1355	17.0	1635
AL-8	14.5	1290	19.5	1635

245 Gr.
Bullet #429421 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	5.0	910	7.5	1160
Unique	8.5	1180	12.0	1485
Herco	11.0	1320	14.5	1625
Blue Dot	14.0	1410	17.5	1655
2400	18.0	1370	22.0	1635
SR4756	11.0	1270	12.5	1405
IMR4227	20.0	1300	24.0	1595
630	15.0	1330	19.0	1555
AL-7	13.0	1365	16.5	1580
AL-8	14.5	1290	19.5	1595

250 Gr. (w/Gas Check)
Bullet #429244 (#2 alloy)

C Designates compressed powder charge



.444 MARLIN

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .431″
Maximum Case Length ..... 2.225″
Trim-to-Length ..... 2.220″
Maximum Overall Length (With Bullet) ..... 2.570″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 14B

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 9½
Cast Bullet Used ..... 42798 - 205 Gr. - 2.580″
*Gas Check *429215 - 215 Gr. - 2.595″
429360 - 232 Gr. - 2.575″
429421 - 245 Gr. - 2.550″
*429244 - 250 Gr. - 2.620″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Marlin 444
Barrel Length ..... 22″
Twist ..... 1-38″
Groove Diameter ..... .431″
(429421 Crimped on forward edge of first driving band)

NOTE: In order to correctly seat cast bullets, they must exceed the maximum overall length as listed. Our data takes this into consideration and the individual overall lengths for each bullet is listed above.

205 Gr.
Bullet #42798 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.5	1330	16.0	1690
Green Dot	11.0	1345	16.5	1700
Unique	12.0	1315	18.0	1705
Blue Dot	15.0	1335	20.0	1745
700X	10.0	1310	15.5	1690
SR7625	13.0	1440	18.0	1755
SR4756	14.0	1425	19.0	1755
630	16.5	1310	22.0	1605

215 Gr. (w/Gas Check)
Bullet #429215 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.5	1335	16.0	1685
Green Dot	11.0	1325	16.5	1685
Unique	12.0	1335	18.0	1735
Blue Dot	15.0	1295	20.0	1690
700X	10.0	1295	15.5	1655
SR7625	13.0	1405	18.0	1705
SR4756	14.0	1350	19.0	1725
630	16.5	1290	22.0	1605

232 Gr.
Bullet #429360 (#2 alloy)

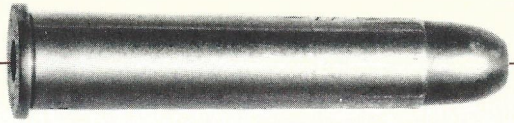
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.5	1295	15.5	1630
Green Dot	11.0	1290	16.0	1615
Unique	12.0	1300	17.5	1660
Blue Dot	15.0	1310	19.5	1605
700X	10.0	1260	15.0	1600
SR7625	13.0	1380	17.5	1650
SR4756	14.0	1365	18.5	1680
630	16.5	1275	22.0	1585

245 Gr.
Bullet #429421 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1225	15.0	1555
Green Dot	10.5	1235	15.5	1570
Unique	11.5	1270	17.0	1620
Blue Dot	14.5	1240	19.0	1570
700X	9.5	1200	14.5	1535
SR7625	12.5	1310	17.0	1590
SR4756	13.5	1305	18.0	1590
630	16.0	1240	21.5	1540

250 Gr. (w/Gas Check)
Bullet #429244 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	10.0	1205	15.0	1520
Green Dot	10.5	1215	15.5	1525
Unique	11.5	1225	17.0	1590
Blue Dot	14.5	1240	19.0	1540
700X	9.5	1175	14.5	1500
SR7625	12.5	1285	17.0	1560
SR4756	13.5	1230	18.0	1560
630	16.0	1210	21.5	1510



45/70 GOVERNMENT

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .456″
Maximum Case Length .....2.105″
Trim-to Length .....2.100″
Maximum Overall Length (With Bullet) .....2.550″
Primer Size .....Large Rifle
Lyman Shell Holder Number 17

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Remington 9½
Cast Bullet Used .....457191 - 292 Gr. - 2.550″
*Gas Check 457122 - 330 Gr. - 2.550″
457124 - 385 Gr. - 2.540″
457193 - 405 Gr. - 2.550″
*457406 - 482 Gr. - 2.550″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Marlin 1895
Barrel Length .....22″
Twist .....1-22″
Groove Diameter ..... .456″

This data designed for use in the following firearms:

1886 Winchester
New 1895 Marlin
Ruger #1
Ruger #3

Do not use bullets #457124 and #457406 in tubular magazines.

292 Gr.
Bullet #457191 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.5	1285	18.0	1460
2400	24.0	1350	30.0	1680
IMR4227	27.0	1365	30.0	1545
IMR4198	32.0	1300	36.0	1515
IMR3031	44.0	1575	50.0	1720
630	23.0	1415	27.0	1590

330 Gr. H.P.
Bullet #457122 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	14.0	1240	17.5	1410
2400	23.5	1325	29.5	1635
IMR4227	26.0	1345	29.0	1470
IMR4198	31.0	1325	35.0	1505
IMR3031	43.0	1545	49.0	1695
630	22.0	1365	26.5	1545

385 Gr.
Bullet #457124 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	13.5	1145	17.0	1330
2400	23.0	1305	29.0	1585
IMR4227	25.0	1280	28.0	1405
IMR4198	30.0	1245	34.0	1425
IMR3031	42.0	1465	47.5	1675
630	21.0	1295	26.0	1515

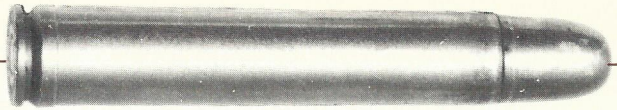
405 Gr.
Bullet #457193 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	13.0	1110	16.5	1260
2400	22.5	1240	28.5	1510
IMR4227	24.0	1140	27.5	1360
IRM4198	29.0	1160	33.0	1370
IRM3031	41.0	1455	46.5	1640
630	20.0	1225	25.0	1410

482 Gr. (w/Gas Check)
Bullet #457406 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	12.0	1010	16.0	1165
2400	21.5	1155	27.5	1410
IMR4227	23.0	1085	27.0	1325
IRM4198	28.0	1195	32.5	1380
IMR3031	40.0	1440	45.5 C	1605
630	19.0	1115	24.5	1315

C Designates compressed powder charge



.458 WINCHESTER MAGNUM (11.5 X 63MM)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .459″
Maximum Case Length .....2.500″
Trim-to-Length .....2.495″
Maximum Overall Length (With Bullet) .....3.340″
Primer Size .....Large Rifle
Lyman Shell Holder Number 13

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester 8½ - 120
Cast Bullet Used .....457191 - 292 Gr. - 2.955″
*Gas Check 457124 - 385 Gr. - 3.012″
*457406 - 482 Gr. - 3.090″
*462560 - 552 Gr. - 3.160″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Ruger #1
Barrel Length .....24″
Twist .....1-14″
Groove Diameter ..... .459″

NOTE: Our best test results were obtained when using the Winchester 8½ - 120 primer. Reloading die adjustments are critical with the heavily compressed loads. If the crimping and seating screw adjustments are not exactly on the crimping groove, the case will be dented or crushed in loading.
Due to heavy recoil, all bullets should be crimped in place.

292 Gr. Bullet #457191 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
IMR4227	44.5	2100	50.5	2305
IMR4198	54.0	2135	58.0	2205
IMR3031	60.0	1885	69.0	2220
IMR4064	64.0	1865	72.0	2110
Unique	19.0	1460	23.0	1625
2400	28.0	1585	33.0	1765

385 Gr. Bullet #457124 (#2 alloy)

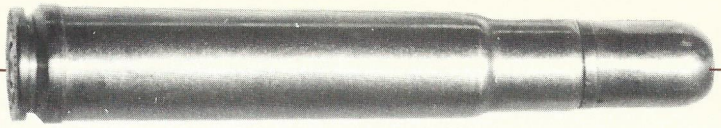
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
IMR4227	44.0	1935	50.0	2090
IMR4198	53.0	2010	57.0	2125
IMR3031	59.0	1900	68.0 C	2210
IMR4064	62.0	1860	70.0 C	2115
Unique	18.0	1315	22.0	1510
2400	25.0	1310	31.0	1565

482 Gr. (w/Gas Check) Bullet #457406 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
IMR4227	41.0	1700	47.0	1855
IMR4198	49.0	1830	53.0	1940
IMR3031	57.0	1850	66.0 C	2120
IMR4064	60.0	1805	68.0 C	2060
Unique	17.0	1175	21.0	1320
2400	24.0	1240	30.0	1480

552 Gr. (w/Gas Check) Bullet #462560 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
IMR4227	39.0	1555	45.0	1705
IMR4198	48.0	1690	52.0	1810
IMR3031	56.0	1745	65.0 C	1980
IMR4064	59.0	1730	67.0 C	1955
Unique	16.0	1050	20.0	1200
2400	23.0	1110	29.0	1330



.460 WEATHERBY MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .457″ to .459″
Maximum Case Length .....2.913″
Trim-to Length .....2.903″
Maximum Overall Length (With Bullet) .....3.750″
Primer Size ..... Large Rifle
Lyman Shell Holder Number 17

TEST COMPONENTS

Cases .....Weatherby
Primers .....Remington 9½
Cast Bullet Used .....*462560 - 552 Gr.
*Gas Check

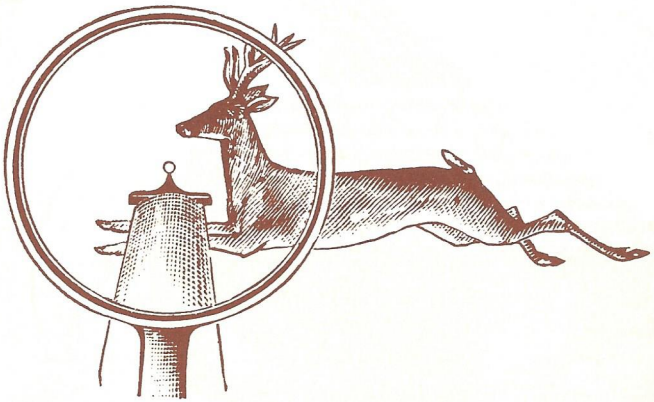
TEST (Velocity) SPECIFICATIONS

Firearm Used .....Weatherby Mark V
Barrel Length .....26″
Twist .....1-16″
Groove Diameter ..... .457″

NOTE: The data listed for this cartridge was obtained in a Weatherby rifle and is intended for Weatherby rifles only. The free-boring constructed into these firearms allow higher velocities at safe working pressures. For custom rifles which are not free-bored, maximum loads should be reduced a full 5%. Even then, they should be approached with caution.
Use only standard large rifle primers with cast bullets.
Due to the heavy recoil of these rifles all bullets should be crimped in place.

552 Gr. (w/Gas Check)
Bullet #462560 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	20.0	1150	28.0	1396



Pistol Data

NATIONAL RIFLE ASSOCIATION
OFFICIAL 25 YD. SLOW FIRE PISTOL TARGET
(STANDARD AMERICAN TYPE)
MATCH #
RELAY #
TARGET #
STAGE #
5
6
7
8
5
B-16
LICENSE NO. 17

.22 REMINGTON JET

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .223″
Maximum Case Length ..... 1.288″
Trim-to Length ..... 1.283″
Maximum Overall Length (With Bullet) ..... 1.659″
Primer Size ..... Small Rifle
Lyman Shell Holder Number 1

TEST COMPONENTS

Cases ..... Remington
Primers ..... Remington 6½
Cast Bullet Used ..... *225107 - 38 Gr.
*Gas Check *225438 - 45 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Smith & Wesson Model 53
Barrel Length ..... 6″
Twist ..... 1-15″
Groove Diameter ..... .223″

NOTE: Remove all traces of lubricant from both the cylinder and cases before firing. This will insure the proper functioning of the cylinder.

38 Gr. (w/Gas Check)
Bullet #225107 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	2.0	1038	3.5	1418
Unique	3.5	1230	5.5	1663
2400	11.0	1872	12.0	1968
SR4756	5.0	1285	6.7	1675
IMR4227	11.0	1742	13.5	2040

45 Gr. (w/Gas Check)
Bullet #225438 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	2.0	940	3.5	1340
Unique	3.5	1131	5.0	1392
2400	10.5	1745	11.5	1897
SR4756	5.0	1313	6.2	1545
IMR4227	10.5	1644	13.0	1992

.221 REMINGTON FIREBALL

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .224″
Maximum Case Length ..... 1.400″
Trim-to-Length ..... 1.395″
Maximum Overall Length (With Bullet) ..... 1.830″
Primer Size ..... Small Rifle
Lyman Shell Holder Number 26

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 7½
Cast Bullet Used ..... *225107 - 38 Gr. - 1.663″
*Gas Check *225438 - 45 Gr. - 1.675″
*225415 - 50 Gr. - 1.705″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Remington XP-100
Barrel Length ..... 10½″
Twist ..... 1-12″
Groove Diameter ..... .224″

NOTE: Heavier bullets gave more uniform results.

38 Gr. (w/Gas Check) Bullet #225107 (#2 alloy)

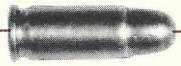
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.0	1250	5.5	1965
Green Dot	3.5	1325	6.0	1995
Unique	4.0	1320	7.0	2055
700X	3.0	1260	5.5	2000
PB	3.5	1270	6.0	1990
SR7625	4.0	1370	6.0	2015
230	3.0	1295	5.5	2000
630	6.0	1480	10.0	2095

45 Gr. (w/Gas Check) Bullet #225438 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	2.5	1050	5.0	1785
Green Dot	3.0	1135	5.5	1800
Unique	3.5	1180	6.5	1910
700X	2.5	1050	4.8	1570
PB	3.0	1090	5.5	1770
SR7625	3.5	1180	5.5	1775
230	2.5	1045	4.8	1570
630	6.0	1400	9.5	1870

50 Gr. (w/Gas Check) Bullet #225415 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	2.5	1015	4.5	1440
Green Dot	3.0	1105	5.0	1665
Unique	3.5	1110	6.0	1755
700X	2.5	1005	4.5	1460
PB	3.0	1050	5.3	1685
SR7625	3.5	1115	5.3	1675
230	2.5	985	4.5	1445
630	5.5	1280	9.0	1750



.25 ACP

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .251″
Maximum Case Length ..... .615″
Trim-to Length ..... .610″
Maximum Overall Length (With Bullet) ..... .910″
Primer Size .....Small Pistol
Shell Holder Number .....RCBS #29

TEST COMPONENTS

Cases .....Remington-Peters
Primers ..... Winchester 1½ - 108
Cast Bullet Used ..... 252435 - 51 Gr. - .862″

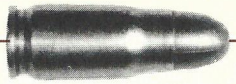
TEST (Velocity) SPECIFICATIONS

Firearm Used .....Sterling 25 Auto
Barrel Length .....2″
Twist .....1-16″
Groove Diameter ..... .251″

All loads functioned test gun

51 Gr.
Bullet #252435 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	0.8	460	1.1	560
Red Dot	0.8	470	1.1	615
Green Dot	1.0	500	1.3	625
Unique	1.2	470	1.6	660
700X	0.8	470	1.1	625
PB	1.0	495	1.4	680
630	2.8	595	3.2	695



.30 LUGER (7.65 PARABELLUM)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .309″
Maximum Case Length ..... .850″
Trim-to Length ..... .845″
Maximum Overall Length (With Bullet) .....1.175″
Primer Size .....Small Pistol
Lyman Shell Holder Number 12

TEST COMPONENTS

Cases .....Remington Peters
Primers .....Remington 1½
Cast Bullet Used .....313249 - 84 Gr. - 1.125″
311227 - 90 Gr. - 1.110″
313226 - 93 Gr. - 1.150″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Walther P-38
Barrel Length .....4 - 15/16″
Twist .....1 - 9.85″
Groove Diameter ..... .3085″

NOTE: Variations in groove diameters will be encountered with pistols chambered for this cartridge. For best results, it is recommended that you slug your barrel. Size cast bullets as near to the exact groove diameter as possible.
When using cast bullet No. 313249, the case should be crimped on the leading edge of the first driving band.
With some pistols, the starting loads may not function the action. In such an instance, the load should be increased, but with caution.

84 Gr.
Bullet #313249 (#2 alloy)

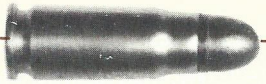
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	3.8	1106	4.5	1244
Red Dot	3.8	1116	4.3	1201
Green Dot	4.2	1111	4.7	1210
Unique	4.6	1110	5.2	1226
700X	3.7	1143	4.2	1204
PB	4.0	1105	4.5	1177
230	3.9	1155	4.4	1218
630	7.5	1106	8.5	1223

90 Gr.
Bullet #311227 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	3.7	1064	4.4	1165
Red Dot	3.7	1072	4.2	1151
Green Dot	4.1	1099	4.6	1192
Unique	4.5	1099	5.1	1189
700X	3.6	1079	4.1	1147
PB	3.9	1036	4.4	1144
230	3.8	1101	4.3	1173
630	7.4	1082	8.4	1207

93 Gr.
Bullet #313226 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	3.6	1026	4.4	1159
Red Dot	3.7	1065	4.2	1152
Green Dot	4.1	1065	4.6	1150
Unique	4.5	1046	5.1	1163
700X	3.5	1037	4.0	1128
PB	3.9	1047	4.4	1126
230	3.8	1086	4.3	1179
630	7.4	1059	8.4	1180



.30 MAUSER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .311″
Maximum Case Length ..... .990″
Trim-to Length ..... .985″
Maximum Overall Length (With Bullet) .....1.381″
Primer Size .....Small Pistol
Lyman Shell Holder Number 12

TEST COMPONENTS

Cases .....Remington
Primers .....Remington 1½
Cast Bullet Used .....313249 - 84 Gr.

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Mauser Military
Barrel Length .....5½″
Twist .....1-8″
Groove Diameter ..... .311″

NOTE: Variations in groove diameters may be encountered. Slug your barrel for best results. We suggest that you use cast bullets sized as close as possible to exact groove diameter.

84 Gr.
Bullet #313249 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	4.2	1128	5.0	1243
Red Dot	5.0	1065	5.6	1115
Unique	5.2	1018	6.8	1193

.30 M 1 CARBINE (REVOLVER)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .308″
Maximum Case Length ..... 1.290″
Trim-to-Length ..... 1.286″
Maximum Overall Length (With Bullet) ..... 1.680″
Primer Size ..... Small Rifle
Lyman Shell Holder Number 19

TEST COMPONENTS

Cases ..... Remington
Primers ..... Remington 6½
Cast Bullet Used ..... *311359 - 120 Gr. - 1.680″
*Gas Check *311576 - 123 Gr. - 1.610″
311410 - 130 Gr. - 1.680″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Ruger Blackhawk
Barrel Length ..... 7½″
Twist ..... 1-20″
Groove Diameter ..... .308″

NOTE: Best ballistic uniformity was obtained with Bullet No. 311410 using AL-8 powder.
This cartridge headspaces on the mouth and case length is, therefore, critical. Never trim cases shorter than the trim-to-length shown and never crimp bullets.

120 Gr. (w/Gas Check) Bullet #311359 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	5.5	1138	6.5	1335
2400	11.0	1236	12.5*	1436
SR7625	4.6	1027	5.6	1162
SR4756	5.5	1050	6.5	1220
IMR4227	11.5	1169	13.3*	1388
AL-8	9.5	1239	11.0*	1408

123 Gr. (w/Gas Check) Bullet #311576 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	5.0	1017	6.3	1316
2400	10.8	1271	12.3*	1445
SR4756	5.1	923	6.1	1172
IMR4227	11.0	1124	13.1*	1342
AL-8	9.2	1196	10.8*	1384

130 Gr. Bullet #311410 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Unique	4.9	1064	6.1	1270
2400	10.5	1282	12.0*	1414
SR4756	5.0	1011	6.0	1182
IMR4227	10.6	1116	12.7*	1387
AL-8	9.0	1225	10.4*	1346

*Designates compressed powder charge

.32 A.C.P. (7.65 MM BROWNING)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .309″
Maximum Case Length ..... .680″
Trim-to-Length ..... .672″
Maximum Overall Length (With Bullet) ..... .984″
Primer Size .....Small Pistol
Lyman Shell Holder Number 23

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester 1½ - 108
Cast Bullet Used .....311252 - 77 Gr. - .975″
313249 - 84 Gr. - .984″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Mauser HSC
Barrel Length .....3.375″
Twist .....1-16″
Groove Diameter ..... .309″

NOTE: A wide variation in groove diameters is present in handguns chambered for this cartridge. All loads function test gun well.

77 Gr.
Bullet #311252 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.5	685	2.0	830
Red Dot	1.5	695	2.3	940
Green Dot	1.6	705	2.4	895
Unique	1.8	625	2.6	860
700X	1.5	750	1.9	895
PB	1.6	665	2.2	870
SR7625	1.7	675	2.3	860
230	1.5	710	2.0	885

84 Gr.
Bullet #313249 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.5	660	1.9	795
Red Dot	1.5	665	2.1	895
Green Dot	1.6	680	2.3	845
Unique	1.8	650	2.5	860
700X	1.3	685	1.7	830
PB	1.5	665	2.1	830
SR7625	1.7	675	2.2	860
230	1.4	670	1.9	840

.32 SMITH & WESSON

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .312″
Maximum Case Length ..... .605″
Trim-to-Length ..... .600″
Maximum Overall Length (With Bullet) ..... .930″
Primer Size .....Small Pistol
Lyman Shell Holder Number 9

TEST COMPONENTS

Cases .....Norma
Primers ..... Winchester 1½ - 108
Cast Bullet Used .....311252 - 77 Gr. - 860″
313249 - 84 Gr. - 860″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Smith & Wesson M31
Barrel Length .....4″
Twist .....1 - 18¾″
Groove Diameter ..... .312″

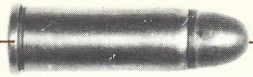
NOTE: Use maximum loads in solid frame revolvers only. For top break models (in good condition) use the suggested starting loads only. Do not go higher as these pistols are of a relatively weak design. Variations in groove diameters may be encountered. Slug your barrel before reloading and size your cast bullets to as near groove diameter as possible.

77 Gr.
Bullet #311252 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.1	450	1.5	550
Red Dot	1.4	550	1.9	735
Green Dot	1.5	525	2.0	695
Unique	1.6	465	2.5	715
700X	1.3	570	1.8	730
PB	1.4	495	2.1	775
230	1.3	555	1.8	750

84 Gr.
Bullet #313249 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.0	440	1.4	550
Red Dot	1.3	560	1.7	675
Green Dot	1.4	500	1.9	700
Unique	1.5	465	2.4	725
700X	1.2	585	1.7	770
PB	1.3	515	1.9	740
230	1.2	540	1.7	705



.32 S & W LONG

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .312″
Maximum Case Length ..... .920″
Trim-to Length ..... .915″
Maximum Overall Length (with bullet) .....1.280″
Primer Size .....Small Pistol
Lyman Shell Holder 9

TEST COMPONENTS

Cases .....Remington-Peters
Primers .....Remington 1½
Cast Bullet Used .....#311252 - 77 Grs. - 1.202″
#313249 - 84 Grs. - 1.230″
#313226 - 93 Grs. - 1.255″
#3118 - 115 Grs. - 1.266″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....S & W M31
Barrel Length .....4″
Twist .....1-18¾″
Groove Diameter ..... .312″

77 Gr.
Bullet #311252 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.5	480	3.0	925
Red Dot	1.8	555	3.3	995
Green Dot	1.9	530	3.4	960
Unique	2.5	575	4.0	910
700X	1.8	565	3.3	1065
SR7625	2.4	550	3.6	955
230	1.7	610	3.2	1030

84 Gr.
Bullet #313249 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.5	500	3.1	940
Red Dot	1.7	560	3.2	965
Green Dot	1.8	515	3.3	935
Unique	2.4	540	3.9	895
700X	1.7	560	3.2	1010
SR7625	2.3	530	3.5	945
230	1.6	515	3.0	945

93 Gr.
Bullet #313226 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.5	485	2.9	865
Red Dot	1.7	515	3.0	910
Green Dot	1.8	495	3.1	860
Unique	2.4	510	3.7	850
700X	1.6	525	3.0	950
SR7625	2.2	520	3.3	920
230	1.6	515	2.9	915

115 Gr.
Bullet #3118 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.4	495	2.0	650
Red Dot	1.6	520	2.5	750
Green Dot	1.7	505	2.6	750
Unique	2.1	525	3.5	830
700X	1.5	515	2.4	785
SR7625	1.9	505	3.0	830
230	1.4	485	2.5	790

9 MM LUGER
(9 MM PARABELLUM)

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .358″
Maximum Case Length ..... .754″
Trim-to-Length ..... .751″
Maximum Overall Length (With Bullet) .....1.169″
Primer Size .....Small Pistol
Lyman Shell Holder Number 12

TEST COMPONENTS

Cases .....Winchester/Western
Primers .....Winchester 1⅛ - 108
Cast Bullet Used .....358242 - 92 Gr. - 1.020″
356404 - 95 Gr. - .915″
358345 - 115 Gr. - 1.000″
358242 - 121 Gr. - 1.045″
356402 - 121 Gr. - 1.088″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length ..... 4″
Twist .....1-10″
Groove Diameter ..... .358″

NOTE: Variations in groove diameters are often encountered with pistols chambered for this cartridge. However, the most common diameter is .354″. This particular cartridge headspaces on the case mouth and, therefore, the case should not be crimped. Also, the trim-to-length should be adhered to closely. A short case, or a crimp on the mouth, can cause problems with headspace. Our most popular cast bullet for this caliber is No. 356402.

92 Gr.
Bullet #358242 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	4.0	1060	19,800	5.2	1315	32,000
Red Dot	4.1	1120	22,800	5.5	1340	32,500
Green Dot	4.3	1095	20,400	6.0	1325	31,000
Unique	5.0	1065	19,800	6.8	1325	31,500
700X	4.1	1125	22,800	5.1	1285	31,000
PB	4.8	1115	19,800	6.0	1360	33,000
SR7625	5.0	1180	23,400	5.9	1310	30,500
230	4.0	1040	19,800	5.0	1280	32,500

95 Gr.
Bullet #356404 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	4.0	1125	23,400	5.0	1290	31,500
Red Dot	4.0	1130	25,200	4.9	1270	31,000
Green Dot	4.1	1065	21,000	5.4	1305	32,000
Unique	4.8	1075	22,200	6.1	1290	31,500
700X	3.7	1120	24,600	4.3	1230	32,000
PB	3.9	1005	18,000	4.9	1235	31,000
SR7625	4.1	1045	19,800	5.1	1260	31,500
230	3.7	1070	23,400	4.6	1245	31,500

115 Gr.
Bullet #358345 (#2 alloy)

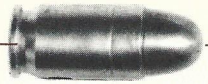
Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.8	1035	22,800	4.9	1200	31,000
Red Dot	3.9	1055	24,600	4.9	1200	32,000
Green Dot	4.0	1030	24,000	5.0	1200	32,500
Unique	4.5	1025	22,200	5.7	1210	31,500
700X	3.7	1045	25,200	4.4	1160	32,500
PB	3.7	995	23,400	4.5	1130	32,000
SR7625	3.8	1005	24,000	4.5	1130	31,000
230	3.7	1055	22,800	4.5	1175	31,000

121 Gr.
Bullet #356402 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.7	950	21,600	4.4	1125	32,000
Red Dot	3.8	1020	26,400	4.5	1130	32,500
Green Dot	3.9	970	22,200	4.8	1165	32,500
Unique	4.3	940	21,000	5.3	1135	31,000
700X	3.3	975	25,200	4.0	1080	33,000
PB	3.4	915	20,400	4.3	1095	31,500
SR7625	3.5	935	21,000	4.3	1080	31,500
230	3.4	960	24,000	4.1	1075	30,000

121 Gr.
Bullet #358242 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.7	990	22,200	4.4	1115	31,000
Red Dot	3.8	1010	23,400	4.5	1115	31,500
Green Dot	3.9	990	23,400	4.8	1105	30,500
Unique	4.3	930	19,800	5.4	1145	31,000
700X	3.4	985	24,000	4.0	1090	31,500
PB	3.5	940	22,200	4.3	1090	31,500
SR7625	3.6	950	22,200	4.4	1100	33,000
230	3.5	990	24,600	4.2	1105	32,000



.380 AUTO

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .355″
Maximum Case Length ..... .680″
Trim-to-Length ..... .677″
Maximum Overall Length (With Bullet) ..... .984″
Primer Size .....Small Pistol
Lyman Shell Holder Number 26

TEST COMPONENTS

Cases .....SUPERVEL
Primers .....Winchester 1⅛ - 108
Cast Bullet Used .....358242 - 92 Gr. - .980″
358242 - 121 Gr. - 980″ 356404 - 95 - .907″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....3¾″
Twist .....1-16″
Groove Diameter ..... .355″

NOTE: While a wide variation in groove diameters may be encountered (as large as .362″) in pistols chambered for this cartridge, the use of bullets larger than .355″ is usually not possible. This is due to chamber and case dimensions. The larger diameter bullet will bulge the case to the point where the cartridge will not chamber. If the groove diameter of your pistol runs on the large size, accuracy will be poor and there is little you can do about it.
Heavier cast bullets of .355″ diameter will sometimes cause slight case bulge with some lots of brass. This is due to the inside taper of the case. It may be ignored as long as the cartridge will chamber and function properly.

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	2.4	750	11,800	3.0	915	16,000
Red Dot	2.0	690	11,000	2.6	880	15,200
Green Dot	2.1	655	10,000	3.0	910	16,000
Unique	3.1	755	11,800	3.7	920	16,000
700X	1.9	695	11,100	2.5	900	15,800
PB	2.2	645	10,300	2.8	860	15,200
230	1.9	695	11,500	2.5	855	15,400

92 Gr.
Bullet #358242 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	2.1	695	11,000	2.8	890	15,800
Red Dot	1.9	650	8,500	2.5	845	14,500
Green Dot	2.0	615	8,500	2.8	865	15,200
Unique	3.0	765	12,100	3.5	880	15,700
700X	1.8	670	9,500	2.3	835	15,000
PB	2.1	655	8,800	2.8	840	14,000
230	1.8	675	9,500	2.4	860	15,400

95 Gr.
Bullet #356404 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	1.6	600	10,500	2.1	750	15,200
Red Dot	1.6	615	11,000	2.1	770	15,800
Green Dot	1.7	620	10,800	2.3	760	15,400
Unique	2.2	630	11,300	2.8	780	15,600
700X	1.4	610	11,300	1.9	750	15,800
PB	1.7	605	10,800	2.2	750	15,800
230	1.5	625	11,400	2.0	760	15,900

121 Gr.
Bullet #358242 (#2 alloy)

.38 SUPER

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .355″
Maximum Case Length ..... .900″
Trim-to Length .....895″
Maximum Overall Length (With Bullet) .....1.280″
Primer Size .....Small Pistol
Lyman Shell Holder Number 12

TEST COMPONENTS

Cases .....Remington-Peters
Primers ..... Winchester 1½ - 108
Case Bullet Used .....356404 - 95 Gr. - 1.082″
356402 - 121 Gr. - 1.257″
358480 - 133 Gr. - 1.216″
358430 - 150 Gr. - 1.260″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....5″
Twist .....1-16″
Groove Diameter ..... .355″

This data intended only for pistols which are chambered for the "Super Auto" cartridge.

95 Gr.
Bullet #356404 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	4.5	1170	19,800	6.0	1425	31,000
Red Dot	4.5	1185	21,600	5.5	1385	31,000
Green Dot	4.8	1200	21,000	6.2	1375	27,000
Unique	5.5	1205	19,800	7.2	1460	31,000
700X	4.2	1185	21,600	5.1	1385	31,500
PB	4.9	1195	20,400	6.7	1430	31,500
230	4.2	1145	19,200	5.7	1425	32,500

121 Gr.
Bullet #356402 (#2 alloy)

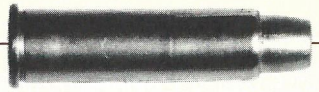
Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	4.0	1005	18,600	5.3	1235	30,000
Red Dot	4.2	1040	21,600	5.2	1230	32,500
Green Dot	4.3	1035	21,000	5.3	1190	29,400
Unique	5.1	1075	20,400	6.0	1255	31,000
700X	3.8	1025	22,200	4.6	1165	31,500
PB	4.3	1035	21,600	5.5	1200	32,000
SR7625	4.5	1040	19,800	5.2	1175	31,500
230	3.8	1000	19,200	5.2	1240	32,000

133 Gr.
Bullet #358480 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	4.0	1000	19,800	5.3	1180	31,500
Red Dot	4.1	1020	22,200	5.0	1170	31,500
Green Dot	4.1	960	19,800	5.3	1140	28,800
Unique	5.1	1045	21,000	6.0	1200	30,000
700X	3.7	995	24,000	4.6	1105	31,000
PB	4.2	975	20,400	5.5	1170	31,500
SR7625	4.5	1025	22,800	5.2	1140	31,000
230	3.8	970	21,000	5.1	1180	32,500

150 Gr.
Bullet #358430 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.8	910	20,400	4.8	1065	31,500
Red Dot	3.9	925	22,200	4.7	1050	31,500
Green Dot	4.0	910	22,200	5.2	1070	31,500
Unique	5.0	1005	24,000	5.7	1110	31,500
700X	3.5	895	22,800	4.3	1025	32,000
PB	4.0	895	21,600	5.0	1050	32,000
SR7625	4.1	905	22,200	4.8	1025	31,000
230	3.5	895	22,200	4.1	980	29,400



.357 MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .356″
Maximum Case Length ..... 1.290″
Trim-to Length ..... 1.285″
Maximum Overall Length (With Bullet) ..... 1.590″
Primer Size ..... Small Pistol
Lyman Shell Holder Number 1

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 5½
Cast Bullet Used ..... 358242 - 92 Gr. - 1.585″
*Gas Check
358345 - 115 Gr. - 1.560″
358242 - 121 Gr. - 1.585″
358480 - 133 Gr. - 1.550″
358495 - 141 Gr. - 1.425″
358477 - 150 Gr. - 1.550″
*358156 - 158 Gr. - 1.590″
358429 - 168 Gr. - 1.565″
358430 - 195 Gr. - 1.580″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 8⅜″
Twist ..... 1-18¾″
Groove Diameter ..... .356″

NOTE: Do not use .38 Special cases for .357 Magnum loads. Use of the smaller case will increase pressure.
Depending upon their manufacture, some variations in groove diameter exists in these handguns. Slug your bore before reloading and size cast bullets to exact groove diameter.
In order to hold the maximum overall length to below 1.590″, it is sometimes necessary to crimp cast bullets on the forward edge of the first driving band.
Bullet No. 358156 is extremely popular and an excellent choice for the heavier loads. Another great favorite is the "Keith type" bullet No. 358429.

92 Gr.
Bullet #358242 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	825	N/A	5.0	1215	N/A
Unique	6.0	1190	N/A	9.0	1645	19,800
Herco	7.0	1145	N/A	12.0	1920	30,000
2400	11.0	1140	N/A	16.0	1705	23,400
700X	3.0	810	N/A	6.0	1475	19,800
SR7625	6.0	1405	17,100	7.5	1610	26,400
IMR4227	9.5	940	N/A	15.5	1535	20,400
630	8.0	1040	N/A	12.0	1455	15,400
AL-7	6.0	1025		9.0	1460	18,000
AL-8	6.0	860		11.0	1425	18,600

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	835	N/A	5.0	1185	16,300
Unique	6.0	1195	14,600	9.0	1645	34,500
Herco	7.0	1245	16,300	12.0	1670	22,800
2400	11.0	1165	13,700	16.0	1625	26,400
700X	3.0	810	N/A	6.0	1350	25,800
SR7625	6.0	1230	18,000	7.5	1440	29,400
IMR4227	9.5	920	N/A	15.5	1410	22,800
630	8.0	995	N/A	12.0	1400	20,400
AL-7	6.0	955		9.0	1395	23,400
AL-8	6.0	795		11.0	1435	26,400

115 Gr.
Bullet #358345 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	805	N/A	5.0	1185	18,000
Unique	6.0	1200	16,300	9.0	1605	32,000
Herco	7.0	1285	20,400	12.0	1715	28,200
2400	11.0	1255	18,600	16.0	1610	27,600
700X	3.5	925	N/A	6.0	1360	34,500
SR7625	6.0	1265	21,600	7.5	1455	39,400
IMR4227	9.5	930	N/A	15.5	1400	21,600
630	8.0	1025	N/A	12.0	1410	23,400
AL-7	6.0	1010		9.0	1405	27,000
AL-8	6.5	895		11.0	1425	25,800

121 Gr.
Bullet #358242 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	855	N/A	5.0	1185	21,000
Unique	5.5	1135	15,400	8.5	1560	37,700
Herco	7.0	1295	22,200	12.0	1745	38,100
2400	11.0	1270	21,600	16.5	1725	38,100
700X	3.5	915	N/A	6.0	1325	38,100
SR7625	5.5	1190	24,000	6.5	1315	35,500
SR4756	5.5	1080	15,400	8.0	1415	34,000
IMR42275	9.5	970	13,700	16.5	1515	32,000
630	9.0	1130	15,400	14.0	1585	35,500
AL-7	6.0	1005	12,900	9.5	1450	34,000
AL-8	7.0	975	12,900	13.0	1550	30,500

133 Gr.
Bullet #358480 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	810	N/A	4.5	1065	20,400
Unique	5.5	1130	19,800	7.5	1420	36,000
Herco	7.0	1280	29,400	10.0	1555	36,900
2400	10.0	1155	19,800	15.0	1590	39,000
700X	3.5	905	15,400	5.0	1155	30,500
SR7625	5.0	1090	22,800	6.0	1230	36,900
SR4756	5.0	950	12,900	7.5	1340	34,000
IMR4227	9.5	940	13,700	15.5	1465	36,400
630	9.0	1110	18,000	13.5	1510	37,300
AL-7	6.0	990	15,400	9.5	1380	32,000
AL-8	7.0	960	14,600	13.0	1545	38,600

141 Gr.
Bullet #358495 (#2 alloy)

.357 MAGNUM

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	820	N/A	4.5	1070	19,800
Unique	5.5	1130	19,200	8.0	1460	39,000
Herco	6.5	1210	24,600	10.0	1550	38,100
2400	10.0	1155	19,800	15.0	1595	38,600
700X	3.5	920	15,400	5.0	1160	29,400
SR4756	5.0	960	12,900	7.5	1330	34,000
IMR4227	9.5	965	13,700	15.5	1440	33,500
630	9.0	1115	18,000	13.5	1510	36,400
AL-7	6.0	995	14,600	9.5	1375	31,000
AL-8	7.0	940	12,900	13.0	1550	38,100

150 Gr.
Bullet #358477 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	780	N/A	4.5	1015	18,600
Unique	5.5	1075	17,100	8.0	1405	35,500
Herco	6.0	1105	20,400	10.0	1460	30,500
2400	10.0	1130	19,800	15.0	1540	36,000
700X	3.5	865	13,700	5.0	1110	30,500
SR4756	5.0	860	N/A	7.5	1275	36,400
IMR4227	9.5	905	13,700	15.5	1410	33,000
630	9.0	1090	18,000	13.5	1475	36,900
AL-7	6.0	925	12,000	9.5	1350	34,000
AL-8	7.0	910	12,900	13.0	1500	36,000

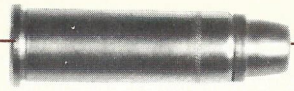
158 Gr. (w/Gas Check)
Bullet #358156 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	780	12,900	4.5	1015	22,800
Unique	5.5	1080	21,600	7.5	1340	39,900
Herco	6.0	1100	25,200	9.0	1395	38,600
2400	10.0	1125	21,600	13.5	1425	37,700
700X	3.5	865	17,100	5.0	1095	38,600
SR4756	5.0	945	14,600	7.0	1205	34,000
IMR4227	9.5	945	15,400	14.5	1340	36,900
630	9.0	1095	20,400	12.5	1395	37,700
AL-7	6.0	965	17,100	9.5	1320	32,500
AL-8	7.0	930	16,300	12.0	1430	39,900

168 Gr.
Bullet #358429 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.0	755	14,600	4.0	895	20,400
Unique	5.0	985	21,000	6.5	1185	37,700
2400	10.0	1095	22,800	12.5	1330	39,000
700X	3.0	740	15,400	4.5	970	34,500
SR4756	4.5	805	12,900	7.0	1130	35,000
IMR4227	9.0	865	16,300	13.5	1265	39,400
630	9.0	1060	23,400	11.5	1280	36,900
AL-8	7.0	915	18,600	11.0	1310	34,400

195 Gr.
Bullet #358430 (#2 alloy)



.38 SPECIAL

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .357″
Maximum Case Length ..... 1.155″
Trim-to-Length ..... 1.149″
Maximum Overall Length (With Bullet) ..... 1.550″
Primer Size ..... Small Pistol
Lyman Shell Holder Number 1

TEST COMPONENTS

Cases ..... Winchester/Western
Primers ..... Winchester 1⅛ - 108
Cast Bullet Used ..... 358242 - 121 Gr. - 1.435″
*Gas Check
358495 - 141 Gr. - 1.310″
35863 - 148 Gr. - Flush
358430 - 150 Gr. - 1.437″
*358156 - 158 Gr. - 1.450″
358429 - 168 Gr. - 1.525″
358430 - 195 Gr. - 1.549″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 7.71″
Twist ..... 1-18¾″
Groove Diameter ..... .3565″

NOTE: Handguns of various makes and models will occasionally vary in groove diameter. It is wise to slug your barrel before selecting a sizing die. Size cast bullets to as near actual groove diameter as possible. No. 358429 is an excellent "Keith type" hunting bullet.

121 Gr.
Bullet #358242 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.4	840	9,000	4.6	1045	14,800
Red Dot	3.6	855	10,500	4.6	1020	14,000
Green Dot	3.8	830	8,300	5.0	1065	15,400
Unique	4.5	850	10,300	5.7	1060	15,200
700X	3.4	865	10,500	4.2	1030	15,700
PB	4.1	870	10,000	5.0	1060	15,200
230	3.5	885	11,400	4.3	1040	15,800

141 Gr.
Bullet #358495 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	2.5	695	8,500	3.5	885	13,300
Red Dot	2.9	760	10,900	3.8	935	15,400
Green Dot	3.1	755	10,000	4.1	930	15,100
Unique	3.8	750	9,300	5.0	980	15,600
700X	2.4	650	7,300	3.6	910	15,400
PB	3.3	750	10,000	4.2	935	15,200
230	2.7	740	9,000	3.6	895	14,300

148 Gr.
Bullet #35863 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	2.5	725	8,000	3.5	920	13,500
Red Dot	2.7	755	10,300	3.7	930	15,000
Green Dot	2.8	720	8,500	3.8	925	15,000
Unique	3.7	770	9,500	4.7	980	15,600
700X	2.3	700	9,000	3.3	915	16,000
PB	2.8	700	8,300	3.8	910	15,500
SR7625	3.3	725	8,000	3.8	885	14,000
230	2.5	710	9,000	3.5	920	15,500

150 Gr.
Bullet #358430 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	2.7	665	7,500	3.7	855	13,500
Red Dot	3.0	730	10,800	4.0	905	15,500
Green Dot	3.1	715	9,300	4.1	890	15,100
Unique	3.9	755	10,900	5.1	930	15,300
700X	2.8	710	9,800	3.7	880	15,700
PB	3.5	720	9,300	4.4	890	14,500
SR7625	4.1	775	10,000	4.8	955	16,000
230	2.9	735	10,800	3.7	885	15,500

158 Gr. (w/Gas Check)
Bullet #358156 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	2.8	710	10,300	3.7	875	15,100
Red Dot	3.0	750	11,600	3.9	895	15,700
Green Dot	3.0	675	8,800	4.2	890	15,600
Unique	3.8	710	9,300	5.1	955	15,900
700X	2.8	700	10,300	3.6	855	15,500
PB	3.4	720	9,800	4.3	875	15,000
SR7625	3.9	710	8,000	4.8	925	15,500
230	2.8	690	10,300	3.7	875	15,800

168 Gr.
Bullet #358429 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	2.6	665	9,000	3.7	865	15,500
Red Dot	2.8	685	10,500	3.7	850	15,500
Green Dot	3.0	695	10,500	4.0	865	15,600
Unique	3.7	710	10,300	5.0	925	15,800
700X	2.7	665	10,600	3.4	800	15,100
PB	3.3	680	9,300	4.3	850	15,200
SR7625	3.5	685	8,800	4.6	890	15,400
230	2.7	695	10,800	3.5	835	15,800

195 Gr.
Bullet #358430 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	2.2	580	9,000	3.3	770	15,400
Red Dot	2.4	600	9,500	3.3	755	15,000
Green Dot	2.6	595	8,800	3.7	785	15,600
Unique	3.4	650	10,000	4.5	830	15,600
700X	2.3	590	9,500	3.1	740	15,600
PB	3.0	625	10,000	3.9	780	15,400
SR7625	3.3	595	7,400	4.5	820	15,000
230	2.3	555	9,000	3.3	765	15,800

.38 SMITH & WESSON

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .360″
Maximum Case Length ..... .775″
Trim-to-Length ..... .765″
Maximum Overall Length (With Bullet) .....1.180″
Primer Size .....Small Pistol
Lyman Shell Holder Number 21

TEST COMPONENTS

Cases .....Western
Primers ..... Winchester 1½ - 108
Cast Bullet Used .....358242 - 121 Gr. - 1.125
358480 - 133 Gr. - 1.062″
358495 - 141 Gr. - .990″
358430 - 150 Gr. - 1.162″
358311 - 158 Gr. - 1.150″

TEST (Velocity) SPECIFICATIONS

Firearms Used .....Smith & Wesson Model 33
Barrel Length .....4″
Twist .....1 - 18¾″
Groove Diameter ..... .360″

121 Gr.
Bullet #358242 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	2.0	560	3.0	805
Red Dot	2.4	650	3.2	855
Green Dot	2.5	615	3.3	815
Unique	3.5	700	4.5	945
700X	2.3	680	3.1	895
PB	2.6	575	3.4	825
SR7625	2.7	580	3.5	830
230	2.2	650	2.8	810

133 Gr.
Bullet #358480 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	2.0	595	2.9	820
Red Dot	2.4	705	3.1	865
Green Dot	2.5	680	3.2	830
Unique	3.5	790	4.2	920
700X	2.3	735	2.9	875
PB	2.6	670	3.2	830
SR7625	2.7	675	3.3	850
230	2.2	705	2.7	815

141 Gr.
Bullet #358495 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.6	510	2.4	720
Red Dot	1.7	560	2.3	715
Green Dot	1.8	530	2.4	680
Unique	3.0	710	3.7	885
700X	1.5	550	2.1	715
PB	1.8	545	2.4	710
SR7625	1.9	535	2.5	725
230	1.5	545	2.2	735

150 Gr.
Bullet #358430 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.9	565	2.8	765
Red Dot	2.3	650	3.0	810
Green Dot	2.4	635	3.1	770
Unique	3.4	725	4.0	865
700X	2.3	705	2.8	815
PB	2.6	680	3.1	790
SR7625	2.7	685	3.2	800
230	2.2	665	2.6	765

158 Gr.
Bullet #358311 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	1.8	545	2.6	730
Red Dot	2.1	605	2.8	770
Green Dot	2.2	595	2.9	745
Unique	3.2	715	3.7	805
700X	2.1	665	2.6	785
PB	2.3	620	2.8	730
SR7625	2.4	660	2.9	770
230	2.0	630	2.4	720

38/40 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .400″ to .401″
Maximum Case Length .....1.305″
Trim-to Length .....1.300″
Maximum Overall Length (With Bullet) .....1.592″
Primer Size .....Large Pistol
Lyman Shell Holder Number 14B

TEST COMPONENTS

Cases .....Winchester
Primers .....Winchester 7-111
Cast Bullet Used .....40143 - 172 Gr.

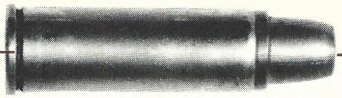
TEST (Velocity) SPECIFICATIONS

Firearm Used .....Colt S.A.A.
Barrel Length .....7½″
Twist .....1-36″
Groove Diameter ..... .400″

NOTE: These loads are not to be used in handguns which were designed for black powder.
A great many revolvers which are chambered for this cartridge have groove and bore dimensions which are so far oversized that it is impossible to obtain accuracy. As chamber dimensions limit the diameter of the bullet, nothing can be done to make these oversize barrels shoot well.

172 Gr.
Bullet #40143 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	4.0	740	5.9	965
Unique	7.0	830	10.0	1105



.41 MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .410″
Maximum Case Length .....1.290″
Trim-to-Length .....1.285″
Maximum Overall Length (With Bullet) .....1.590″
Primer Size .....Large Pistol
Lyman Shell Holder Number 30

TEST COMPONENTS

Cases .....Remington Peters
Primers .....Remington 2½
Cast Bullet Used .....41026 - 199 Gr. - 1.525″
41028 - 212 Gr. - 1.586″
410459 - 220 Gr. - 1.700″
410426 - 240 Gr. - 1.707″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....10.135″
Twist .....1-18¾″
Groove Diameter ..... .409″

NOTE: Very uniform velocities were obtained with all of the loads listed. Correct seating of some cast bullets require that you exceed the maximum overall length listed. The proper overall lengths with these bullets are listed above. The data listed for these bullets takes this extra length into consideration.
Bullet No. 410426 is extremely popular in this caliber.

199 Gr.
Bullet #41026 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Unique	7.5	1090	18,600	10.5	1425	39,000
Herco	9.0	1195	23,400	12.0 C	1475	39,900
Blue Dot	11.5	1215	18,000	16.0	1615	39,900
2400	14.0	1170	19,800	19.0	1510	37,700
SR4756	9.0	1215	22,200	12.0	1445	38,100
IMR4227	15.5	1090	19,800	20.0 C	1430	37,700
230	5.5	1015	19,800	7.5	1220	36,900
630	11.0	1080	18,600	16.5	1450	36,400

C Designates compressed powder charge

212 Gr.
Bullet #41028 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Unique	7.0	985	14,600	11.0	1400	36,900
Herco	9.0	1135	19,200	13.5 C	1490	37,700
Blue Dot	12.5	1225	18,600	17.0	1590	34,000
2400	14.5	1105	18,600	20.0 C	1545	35,500
SR4756	9.0	1020	14,600	13.0	1450	38,100
IMR4227	17.0	1090	17,100	22.0 C	1485	35,500
230	6.5	1050	21,000	9.0	1250	35,500
630	12.0	1095	18,600	17.5	1465	37,500

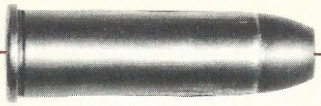
220 Gr.
Bullet #410459 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Unique	7.0	935	13,700	11.0	1380	38,100
Herco	9.0	1055	19,200	13.5 C	1435	38,100
Blue Dot	12.5	1220	19,200	17.5	1625	39,400
2400	14.5	1100	19,200	21.0 C	1565	38,100
SR4756	9.5	1135	19,800	13.0	1420	36,900
IMR4227	17.5	1120	18,600	22.5 C	1495	39,400
230	6.5	1035	21,000	9.0	1230	38,100
630	12.0	1060	18,600	17.5	1440	36,400

240 Gr.
Bullet #410426 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Unique	7.0	930	15,400	10.0	1265	38,100
Herco	8.5	1020	19,800	13.0	1360	38,100
Blue Dot	12.0	1190	22,800	16.5	1520	39,900
2400	14.0	1075	19,800	20.0 C	1505	39,400
SR4756	9.0	1070	21,600	11.5	1290	38,600
IMR4227	17.0	1105	21,000	20.5 C	1385	37,300
230	5.5	925	20,400	8.0	1130	37,300
630	12.0	1065	21,000	17.0	1390	39,400

C Designates compressed powder charge



44/40 WINCHESTER

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .425″ to .429″
Maximum Case Length .....1.305″
Trim-to Length .....1.300″
Maximum Overall Length (With Bullet) .....1.592″
Primer Size .....Large Pistol
Lyman Shell Holder Number 14B

TEST COMPONENTS

Cases .....Winchester
Primers .....Winchester 7-111
Cast Bullet Used .....42798 - 205 Gr.

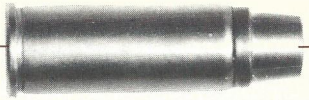
TEST (Velocity) SPECIFICATIONS

Firearm Used .....Colt S.A.A.
Barrel Length .....7½″
Twist .....1-20″
Groove Diameter ..... .426″

NOTE: These loads are not to be used in handguns that were designed for black powder.A wide variation in groove diameters exist with handguns chambered for this cartridge. Slug your barrel before reloading and size cast bullets as near to actual groove diameter as possible.

205 Gr.
Bullet #42798 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	4.0	695	6.6	945
Unique	6.0	750	10.9	1095



.44 SPECIAL

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .431″
Maximum Case Length ..... 1.160″
Trim-to Length ..... 1.152″
Maximum Overall Length (with bullet) ..... 1.615″
Primer Size ..... Large Pistol
Lyman Shell Holder Number 7

TEST COMPONENTS

Cases ..... Remington-Peters
Primers ..... Remington 2½
Cast Bullet Used ..... 429348 - 180 Gr. - 1.395″
*Gas Check * 429215 - 215 Gr. - 1.500″
429360 - 232 Gr. - 1.525″
429421 - 245 Gr. - 1.571″
* 429244 - 250 Gr. - 1.550″

TEST (Velocity) SPECIFICATIONS

Firearm Used ..... Ruger Super Black Hawk
Barrel Length ..... 7½″
Twist ..... 1-20″
Groove Diameter ..... .431″

180 Gr.
Bullet #429348 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	4.0	620	7.0	1035
Green Dot	4.5	620	7.5	1015
Unique	5.0	585	8.5	1020
700X	4.0	575	6.5	990
PB	4.5	555	7.5	960
SR7625	5.0	535	8.0	970
230	4.0	600	6.5	960
630	8.0	585	13.0	1010

215 Gr. (w/Gas Check)
Bullet #429215 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	4.0	625	6.5	945
Green Dot	4.5	620	6.5	900
Unique	5.0	590	8.0	935
700X	4.0	585	6.0	895
PB	4.5	555	7.0	900
SR7625	5.0	585	7.5	950
230	4.0	625	6.0	905
630	8.0	610	12.5	930

232 Gr.
Bullet #429360 (#2 alloy)

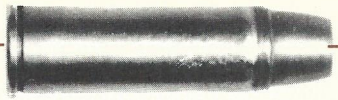
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.5	575	6.0	890
Green Dot	4.0	610	6.0	860
Unique	4.5	555	7.5	930
700X	3.5	565	5.5	865
PB	4.0	540	6.5	885
SR7625	4.5	580	6.5	860
230	3.5	590	5.5	865
630	7.5	635	11.5	925

245 Gr.
Bullet #429421 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.5	575	5.5	840
Green Dot	3.5	525	5.5	795
Unique	4.0	455	7.0	880
700X	3.0	510	5.0	805
PB	4.0	540	6.0	825
SR7625	4.0	500	6.0	800
230	3.0	480	5.0	775
630	7.0	570	11.0	870

250 Gr. (w/Gas Check)
Bullet #429244 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	3.5	545	5.5	815
Green Dot	3.5	510	5.5	770
Unique	4.5	510	7.0	820
700X	3.0	465	5.0	795
PB	4.0	510	6.0	795
SR7625	4.0	440	6.5	820
230	3.0	450	5.0	760
630	7.0	555	11.0	875



.44 REMINGTON MAGNUM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .429″
Maximum Case Length ..... 1.285″
Trim-to-Length ..... 1.280″
Maximum Overall Length (With Bullet) ..... 1.610″
Primer Size ..... Large Pistol
Lyman Shell Holder Number 7

TEST COMPONENTS

Cases ..... Remington Peters
Primers ..... Remington 2½
Cast Bullet Used ..... 429348 - 180 Gr. - 1.420″
*Gas Check *429303 - 205 Gr. - 1.692″
*429215 - 215 Gr. - 1.645″
429360 - 232 Gr. - 1.655″
429421 - 245 Gr. - 1.710″
*429244 - 250 Gr. - 1.680″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used ..... Universal Receiver
Barrel Length ..... 6.5″
Twist ..... 1-20″
Groove Diameter ..... .429″

NOTE: To prevent bullet movement when the gun is under recoil, the cartridge requires a hard crimp on all of the heavier loads.
Proper seating of some cast bullets requires that you exceed the maximum overall length listed. The correct overall lengths with these bullets are shown above. Data for these bullets takes this extra length into consideration.
Cast bullet 429421 gave best results.

180 Gr.
Bullet #429348 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	5.0	795	N/A	7.5	1110	17,100
Unique	8.0	1000	N/A	13.5	1550	34,000
Herco	11.0	1099	17,100	15.5	1510	25,800
Blue Dot	14.0	1165	13,700	21.0	1695	35,000
2400	18.0	1160	16,300	24.0	1555	30,000
SR4756	12.0	1300	20,400	17.0	1655	39,000
IMR4227	19.0	1015	N/A	27.0 C	1595	34,000
630	15.0	1155	16,300	21.5	1585	34,000
AL-7	12.0	1105	N/A	19.0	1600	31,000
AL-8	14.0	1080	13,700	20.0 C	1450	25,800

C Designates compressed powder charge

205 Gr. (w/Gas Check)
Bullet #429303 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	5.0	830	N/A	7.5	1085	19,200
Unique	8.0	1005	12,900	13.5	1515	39,000
Herco	11.0	1185	18,000	15.5	1495	33,000
Blue Dot	14.0	1215	19,200	19.5	1595	38,100
2400	18.0	1195	19,200	24.0 C	1525	35,500
SR4756	12.0	1255	22,200	16.0	1510	39,000
IMR4227	19.0	1025	12,900	26.0 C	1500	36,000
630	15.0	1140	18,600	20.5	1485	35,000
AL-7	12.0	1080	12,900	19.0	1555	35,500
AL-8	14.0	1110	18,000	20.0 C	1395	28,200

215 Gr. (w/Gas Check)
Bullet #429215 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	5.0	765	N/A	7.5	1040	17,100
Unique	8.5	1015	12,900	12.5	1365	30,000
Herco	11.0	1105	12,900	15.5	1415	25,800
Blue Dot	14.0	1135	15,400	19.5	1580	37,700
2400	18.0	1200	20,400	23.5 C	1490	34,000
SR4756	12.0	1265	26,400	15.0	1460	39,000
IMR4227	20.0	1070	14,600	25.5 C	1465	36,000
630	15.0	1120	19,200	20.5	1455	35,000
AL-7	13.0	1170	19,200	18.5	1600	37,700
AL-8	14.5	1110	18,600	20.0 C	1575	31,000

232 Gr.
Bullet #429360 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	5.0	795	N/A	7.5	1055	19,800
Unique	8.5	1045	15,400	12.5	1400	36,900
Herco	11.0	1160	21,000	15.0	1440	36,400
Blue Dot	14.0	1200	19,800	18.5	1510	38,100
2400	18.0	1200	22,200	23.0 C	1505	36,900
SR4756	11.5	1185	23,400	14.0	1385	39,900
IMR4227	20.0	1095	19,200	24.5 C	1420	34,500
630	15.0	1130	20,400	19.5	1400	34,500
AL-7	13.0	1155	21,000	17.5	1480	37,700
AL-8	14.5	1110	19,200	20.0	1540	35,000

C Designates compressed powder charge

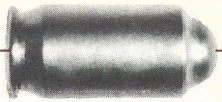
245 Gr.
Bullet #429421 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	5.0	790	N/A	7.5	1020	21,000
Unique	8.5	1015	17,100	12.0	1310	35,500
Herco	11.0	1140	22,800	14.5	1350	36,000
Blue Dot	14.0	1185	22,200	17.5	1440	35,500
2400	18.0	1175	22,800	22.5 C	1445	36,900
SR4756	11.0	1120	21,600	13.0	1295	36,900
IMR4227	20.0	1105	20,400	24.0 C	1365	34,000
630	15.0	1115	21,000	19.5	1380	36,000
AL-7	13.0	1140	22,200	17.0	1420	37,700
AL-8	14.5	1105	21,000	19.5	1385	34,500

250 Gr. (w/Gas Check)
Bullet #429244 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	5.0	775	N/A	7.5	1025	21,600
Unique	8.5	1045	19,200	12.0	1325	38,100
Herco	11.0	1165	25,800	14.5	1360	37,300
Blue Dot	14.0	1175	22,200	17.5	1430	37,700
2400	18.0	1150	21,600	22.0 C	1390	36,400
SR4756	11.0	1135	25,200	12.5	1255	34,000
IMR4227	20.0	1115	21,000	24.0 C	1365	36,000
630	15.0	1125	22,800	19.0	1340	36,900
AL-7	13.0	1150	24,600	16.5	1390	37,300
AL-8	14.5	1100	21,000	19.5	1370	37,300

C Designates compressed powder charge



45 ACP

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .450″
Maximum Case Length ..... .898″
Trim-to Length ..... .895″
Maximum Overall Length (With Bullet) .....1.275″
Primer Size .....Large Pistol
Lyman Shell Holder Number 2

TEST COMPONENTS

Cases .....Remington-Peters
Primers ..... Remington 2½
Cast Bullets Used: .....452389 - 185 Gr. - 1.080″
452488 - 195 Gr. - 1.120″
452460 - 200 Gr. - 1.153″
452374 - 225 Gr. - 1.275″
452423 - 238 Gr. - 1.130″

TEST (Velocity & Pressure) SPECIFICATIONS

Firearm Used .....Universal Receiver
Barrel Length .....5″
Twist .....1-16″
Groove Diameter ..... .450″

185 Gr.
Bullet #452389 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.5	660	6,000	5.0	890	12,300
Red Dot	4.0	735	8,100	5.5	970	14,800
Green Dot	4.5	745	8,300	6.0	965	14,800
Unique	5.0	684	6,900	7.5	995	15,500
700X	4.0	760	8,800	5.5	1010	17,500
PB	4.6	740	8,300	5.5	920	13,500
SR7625	5.5	825	9,800	6.5	1030	17,400
230	4.0	750	9,000	5.5	1010	17,000

195 Gr.
Bullet #452488 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.5	680	7,700	5.0	895	13,900
Red Dot	4.0	730	9,000	5.5	950	16,200
Green Dot	4.5	740	9,400	6.0	955	15,800
Unique	5.0	695	7,900	7.5	1010	16,800
700X	4.0	735	9,600	5.2	950	16,700
PB	4.6	765	10,100	5.5	910	14,800
SR7625	5.0	780	10,300	6.2	945	16,200
230	4.0	770	11,100	5.2	960	16,600

200 Gr.
Bullet #452460 (#2 alloy)

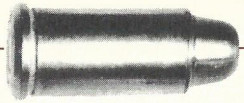
Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	3.5	645	6,900	5.0	860	13,400
Red Dot	4.0	695	8,400	5.3	895	14,700
Green Dot	4.5	715	9,000	5.8	895	14,400
Unique	5.0	670	7,700	7.5	980	16,600
700X	4.0	745	10,300	5.2	940	17,300
PB	4.6	725	9,000	5.5	880	14,200
SR7625	5.0	735	9,000	6.2	945	17,000
230	4.0	710	8,800	5.2	910	15,500

225 Gr.
Bullet #452374 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	4.0	680	10,100	5.0	815	14,400
Red Dot	4.3	705	11,000	5.3	835	15,300
Green Dot	4.8	725	11,400	5.8	845	15,100
Unique	5.5	695	10,100	7.3	905	16,500
700X	4.0	695	10,500	5.0	855	17,300
PB	4.8	705	10,300	5.5	810	14,200
SR7625	5.0	675	9,000	6.0	850	15,200
230	4.2	710	11,400	5.2	855	16,600

238 Gr.
Bullet #452423 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	C.U.P.	Max. Grs.	F.P.S.	C.U.P.
Bullseye	4.0	715	11,100	4.9	860	16,600
Red Dot	4.0	720	11,700	5.0	865	16,800
Green Dot	4.5	755	12,300	5.4	875	16,600
Unique	5.2	740	11,900	6.3	885	16,700
700X	3.7	730	12,600	4.5	825	16,400
PB	3.9	710	11,600	4.8	835	17,100
SR7625	4.2	710	11,600	5.0	815	16,600
230	3.8	715	12,300	4.8	850	17,600



.45 AUTO RIM

CARTRIDGE SPECIFICATIONS

Bullet Diameter ..... .451″
Maximum Case Length ..... .898″
Trim-to-Length ..... .894″
Maximum Overall Length (With Bullet) .....1.275″
Primer Size .....Large Pistol
Lyman Shell Holder Number 14A

TEST COMPONENTS

Cases .....Remington Peters
Primers .....Remington 2½
Cast Bullet Used .....452389 - 185 Gr. - 1.118″
452460 - 200 Gr. - 1.190″
452374 - 225 Gr. - 1.265″
452423 - 238 Gr. - 1.200″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Smith & Wesson M25
Barrel Length ..... 6 ½″
Twist .....1-16″
Groove Diameter ..... .451″

NOTE: Heavier loads for this cartridge should be lightly crimped to prevent bullet movement when the pistol is under recoil.

185 Gr. Bullet #452389 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	3.0	505	4.8	780
Red Dot	4.0	650	5.3	885
Green Dot	4.5	650	5.8	855
Unique	5.0	600	7.0	870
700X	4.0	655	5.3	905
PB	4.5	620	5.8	855
SR7625	5.0	615	6.3	810
230	4.0	700	5.3	905

200 Gr. Bullet #452460 (#2 alloy)

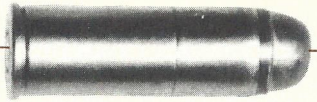
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	3.0	510	4.7	775
Red Dot	4.0	645	5.2	845
Green Dot	4.5	660	5.6	840
Unique	5.0	610	6.8	845
700X	4.0	675	5.0	875
PB	4.5	650	5.5	840
SR7625	5.0	660	6.1	850
230	4.0	675	5.0	850

225 Gr. Bullet #452374 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	3.0	475	4.5	690
Red Dot	4.0	625	5.0	760
Green Dot	4.5	615	5.4	750
Unique	5.0	550	6.6	785
700X	4.0	625	4.8	770
PB	4.5	565	5.4	735
SR7625	5.0	560	5.9	750
230	4.0	600	4.8	745

238 Gr. Bullet #452423 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Bullseye	3.0	500	4.5	720
Red Dot	3.5	590	4.3	715
Green Dot	4.0	605	4.8	715
Unique	4.8	585	6.0	750
700X	3.7	620	4.5	755
PB	3.9	535	4.8	690
SR7625	4.1	505	4.9	655
230	3.7	610	4.5	740



.45 COLT

CARTRIDGE SPECIFICATIONS

Bullet Diameter Cast ..... .451″
Maximum Case Length .....1.285″
Trim-to Length .....1.280″
Maximum Overall Length (With Bullet) .....1.600″
Primer Size .....Large Pistol
Lyman Shell Holder Number 11

TEST COMPONENTS

Cases .....Winchester/Western
Primers ..... Winchester 7-111
Cast Bullet Used .....45468 - 175 Gr. - 1.560″
454309 - 235 Gr. - 1.575″
454190 - 250 Gr. - 1.600″
454424 - 255 Gr. - 1.575″

TEST (Velocity) SPECIFICATIONS

Firearm Used .....Ruger Black Hawk
Barrel Length 7½
Twist 1-16
Groove Diameter ..... .451″

175 Gr.
Bullet #45468 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	4.0	475	7.0	885
Green Dot	4.5	490	7.5	935
Unique	6.0	595	10.0	1035
700X	4.0	435	7.0	910
PB	4.5	440	7.5	845
SR7625	6.0	510	9.5	925
230	4.0	460	7.0	895
630	9.0	525	13.5	865

235 Gr.
Bullet #454309 (#2 alloy)

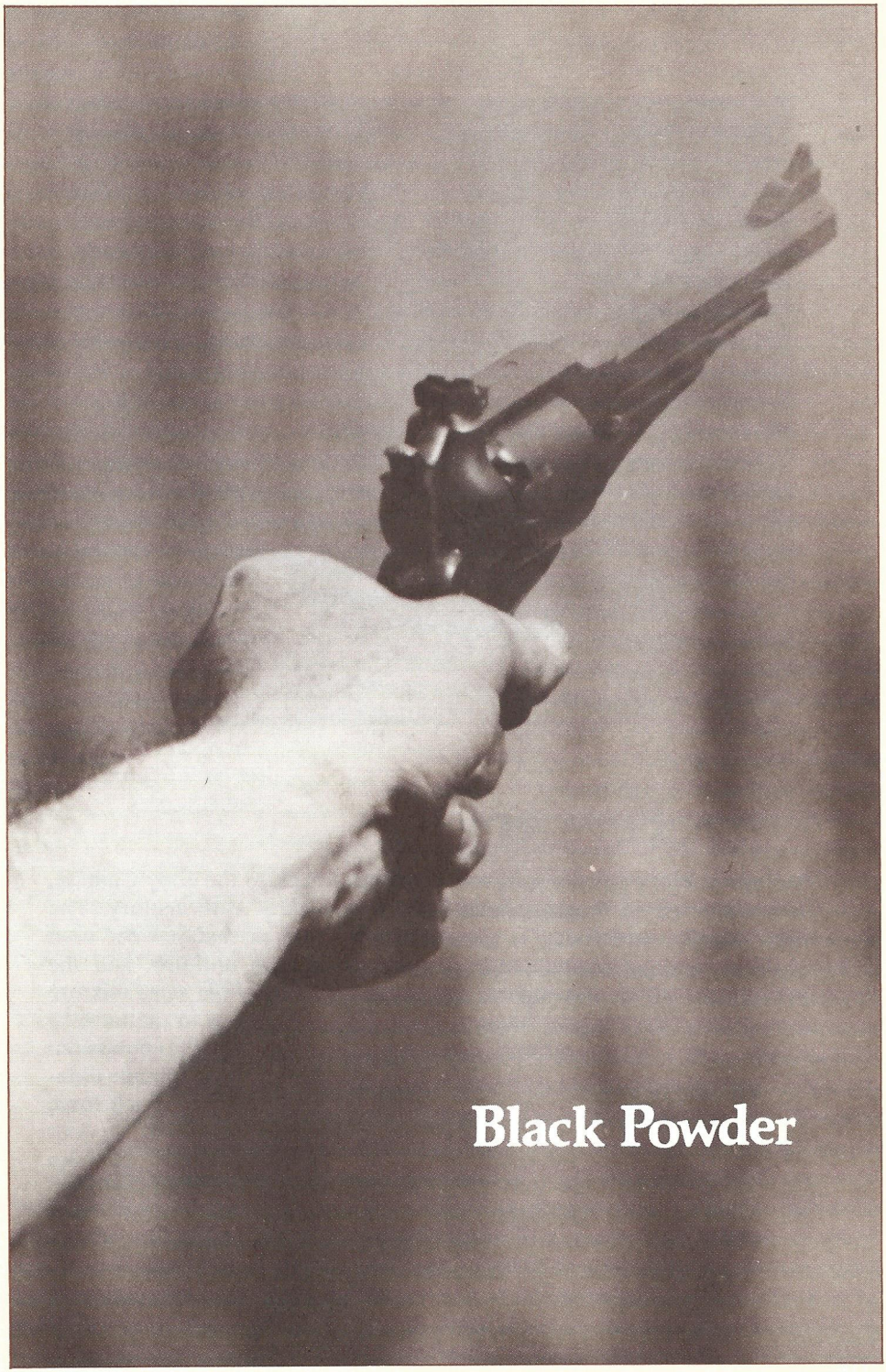
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	4.5	520	7.0	870
Green Dot	4.5	500	7.5	870
Unique	6.0	570	9.5	915
700X	4.5	535	6.5	845
PB	5.0	500	7.5	800
SR7625	6.0	540	9.0	880
230	4.5	515	6.5	815
630	9.0	540	13.5	840

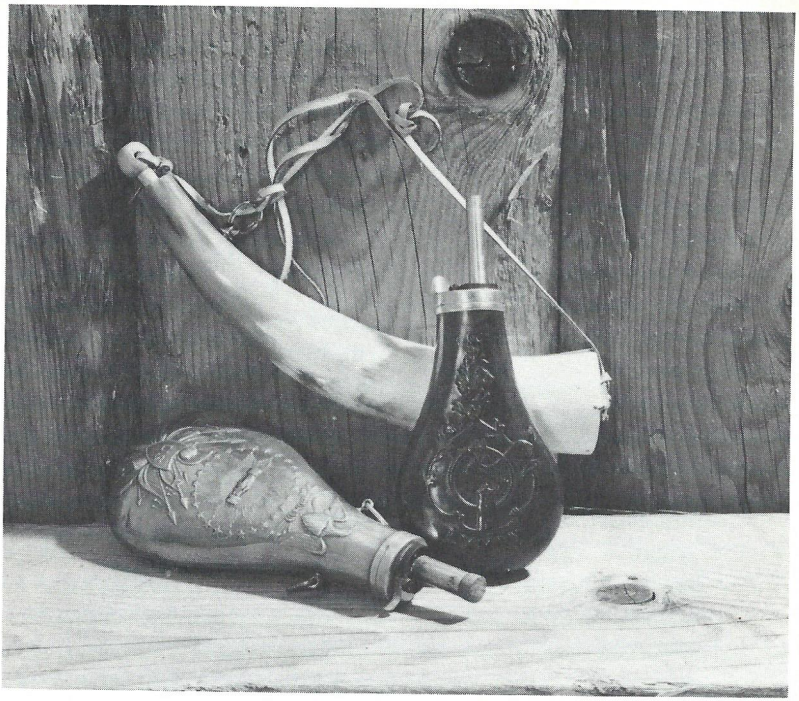
250 Gr.
Bullet #454190 (#2 alloy)

Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	4.5	535	6.5	835
Green Dot	4.5	505	7.0	835
Unique	6.0	595	9.0	875
700X	4.5	535	6.0	800
PB	5.0	545	7.5	820
SR7625	6.0	555	8.5	890
230	4.5	530	6.5	850
630	9.0	560	13.0	850

255 Gr.
Bullet #454424 (#2 alloy)

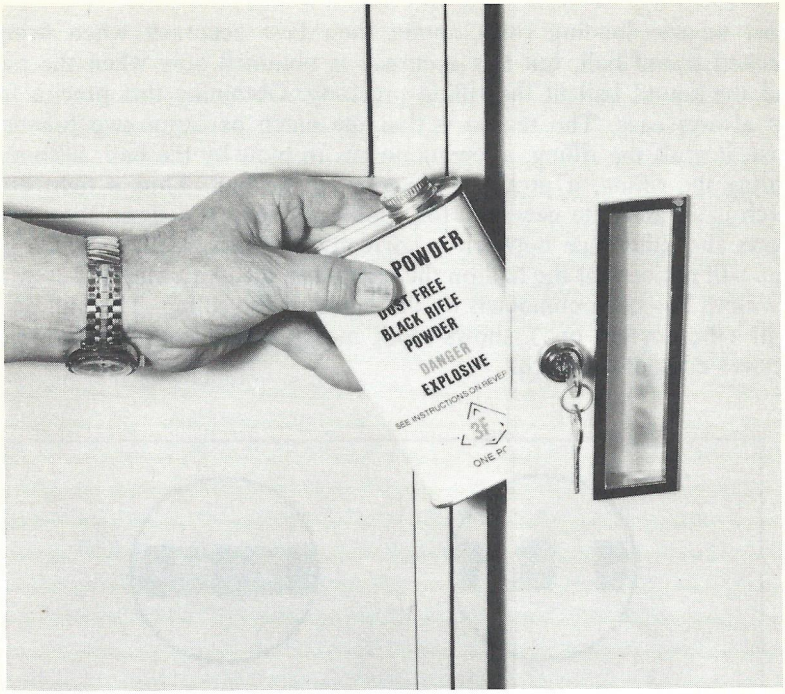
Powder	Sug. Start Grs.	F.P.S.	Max. Grs.	F.P.S.
Red Dot	4.5	550	6.0	780
Green Dot	4.5	500	6.5	765
Unique	6.0	590	8.5	845
700X	4.5	535	6.0	785
PB	5.0	530	7.0	750
SR7625	6.0	555	8.0	835
230	4.5	525	6.0	765
630	9.0	555	12.5	820


Black Powder



Black Powder

The use of black powder as a propellent goes back to the early Chinese. Its original use in firearms dates back to the early 14th century. The black powder used today is essentially the same as that powder used centuries ago. Its manufacture is, of course, more uniform, and the quality level is generally higher, but it is still essentially the same mixture of saltpeter, charcoal and sulphur. Each component adds to the burning process: the charcoal releases carbon dioxide, the saltpeter (potassium nitrate) supplies oxygen to burn, and the sulphur supplies sulphur dioxide—all of which add up to an explosive mixture of gases which force the bullet down the bore. Today's black powders are available in four different granulations for small arms. The size of the powder granules generally determines the use of the powder, the smallest granules being the fastest burning, the largest being the slowest burning.



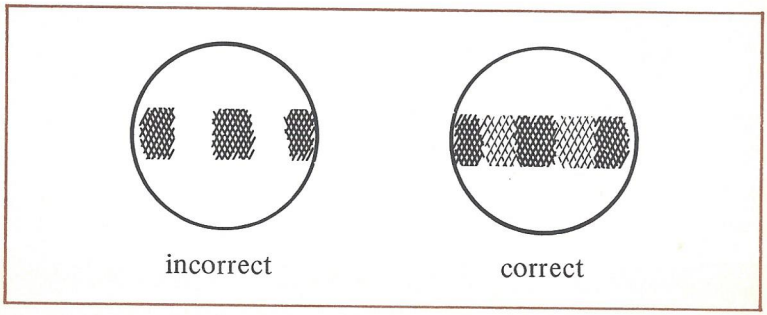
How to Store Black Powder

Black powder storage is a little more tricky than conventional smokeless powder storage because black powder, being more sensitive than smokeless powder, is qualified as a Class A explosive. It may be ignited by percussion or static electricity. Thus we recommend that it be stored with extreme care. Never keep more black powder around than you can use in a relatively short period of time.

In addition, black powder should never be stored with your other smokeless powders, and whenever possible it should be stored away from the home. If it must be stored within the home, be sure that it is segregated from any combustible material, and that it is stored in compliance with regulations for smokeless powder. *Always be sure that the black powder is locked away from children.* It is also wise to check local fire regulations when considering storage of black powder.

The Patched Rifle Ball

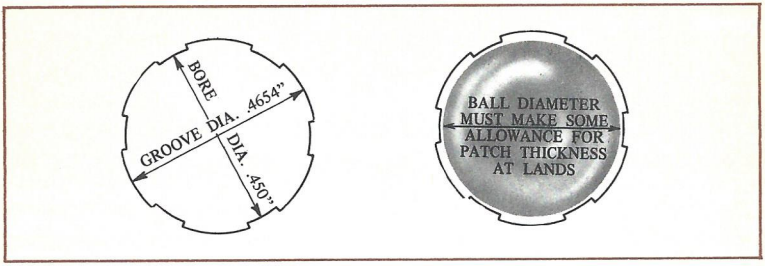
Most muzzle loading rifles obtain their best accuracy when firing a patched round ball, but this accuracy is obtained only when the patch and the round ball fit the rifling precisely. Obtaining this precise fit is not always easy. The reason is that the patch performs two functions. First, it seals the rifling, allowing no gas to blow by the ball. Second, in sealing the rifling, it provides the spin on the ball. Thus a tight fitting patch is an absolute necessity for good accuracy. The illustration below shows the difference between a correctly and incorrectly patched ball. You will notice that the ball on the left shows the cloth marks only where the cloth has been contacted by the lands of the rifling. The ball on the right (the correct one) shows cloth marks where both the lands and grooves contact the cloth.



When trying to obtain a tight fitting patch and ball combination, the shooter must be careful not to load a ball and patch combination that is too tight, thus requiring excessive pounding of the ball to seat it at the bottom of the bore. This pounding will deform the ball and therefore destroy any accuracy that might have been obtainable through a good patched ball fit. As one can see, obtaining a precise fit of patch and ball to the bore is a very tricky, even trial-and-error type of process. To determine the correct ball size and the correct patch thickness, first remove the rifle's breech plug and slug the bore, as described on page 26 in this book.

Once you have measured the outside or groove diameter of the slug, you then measure the bore diameter or the narrowest portion, as shown in the illustration below. If you subtract the bore diameter from the groove diameter and divide by two, you have the depth of the rifling. The depth of the rifling will give a figure to use when deciding on a correct patch thickness.

The following is an example of how the correct patch ball combination is fitted to an individual bore. For your example, we will use a six groove barrel which has a groove diameter of .465″ and a bore diameter of .450″. If we subtract the bore diameter from the groove diameter and divide by 2, we determine the groove depth, or the depth of the rifling.



groove diameter	.465″
minus bore diameter	.450″
	2) .015″
	.0075″

On this particular barrel, the depth of the rifling is .0075″, but for our purposes we can round it out to .008″. We now know that if our patch is to seal the grooves, it must be a good bit thicker than .008″. We also know that our ball diameter must be somewhat smaller than .450″ to allow for the compressed thickness of the patch at the lands.

From this point on, our procedure loses its technical approach and becomes somewhat a matter of guesswork. First, we look around for suitable samples of patching material. Our choice should be a tough material that will stand the abuse of being shot out of a rifle. For our example, we have selected a piece of blue denim cloth for patching, because it is readily available and tough. Also, the denim measures .014″ compressed*, which is thick enough to fill our .008″ grooves.

Now that we have our patch, we must decide on a round ball diameter. *Deducting one thickness of the cloth patch from the bore diameter* is an acceptable means, hence we use it for our example.

bore diameter	.450″
one thickness of cloth	−.014″
	.436″ ball diameter

*By compressed, we mean held firmly in a micrometer so that a reasonable tug with the fingers will not free the material from the instrument. Naturally, our patch material will compress even more when it is wet with saliva and actually loaded into the barrel.

If we check the Lyman list of round ball moulds available we will see that a .437″ mould is as close as we can come to our .436″ measurement. Considering that our cloth patch (when wet) will compress even further, we realize that the .437″ mould will work favorably. We now have a combination of patch and round ball that will load into the rifle. Let's check it out and see if it seals our grooves.

.437″ ball
+.028″ (2 thicknesses of cloth patch)
.465″ diameter of total combination

We know our groove diameter is .465″; we see that our combination (.465″) affords very little compression of the patch in the grooves. If we wish, we can accept this combination as a compromise between loadability and complete bore sealing; or, we can experiment with slightly thicker patching material or a larger round ball diameter.

A variation of the above method, when no suggested ball size is available, is to measure the bore diameter at the muzzle of your rifle with a vernier caliper insuring that the tips of the caliper measure from land to land. Then, in the same fashion, measure the groove diameter. Use the two figures to compute your ball diameter and patch thickness as outlined above.

In addition, many manufacturers of reproductions offer suggested sizes for a patched ball. Using the suggested size ball, you can obtain very good accuracy through experimentations with different patch materials.

To experiment further requires you to have previous experience and familiarity with your rifle. Also, special loading implements are needed to load the tighter fitting combinations.

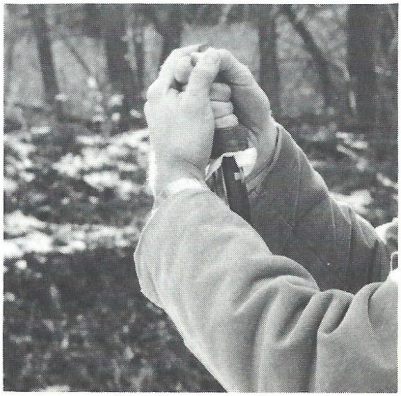
Black Powder
Shooting

Loading a Patched Ball Rifle

Before loading, always make sure that the piece is empty. Aim it in a safe direction, then snap a few percussion caps on the nipple. This will insure ignition by clearing the nipple and vent of any oil that may have accumulated. Leave the hammer down on a spent cap, place the butt of the rifle on the ground, and hold the muzzle away from your body. Expose as little of your hand as possible over the muzzle while loading.

1. Pour a measured charge of powder down the muzzle and strike the barrel a few times with the heel of your hand. This will settle the powder in the barrel.
2. Wet the patch well with saliva and place it over the muzzle. Always keep the grain of the patch in the same direction. Lay the ball on the patching with the sprue mark up. Using a firm (two hand) hold, press the ball down into the muzzle with the *handle end of the short starter*. The top of the ball should be flush with the muzzle.
3. Cut the patch material flush with the muzzle.
4. Using the rod end of the short starter, drive the ball into the barrel (about 5″) by hitting the starter handle a sharp blow with the hand.
5. Use the ram rod to push the ball the rest of the way to the powder. Seat the ball firmly on the powder, but don't pound on it with the ram rod. It's a good idea to mark the ram rod on a fully seated load to use as a future guide in making sure that all loads are safely seated. Never allow an air gap to occur between powder and ball, as excessive pressures may result.

1



2

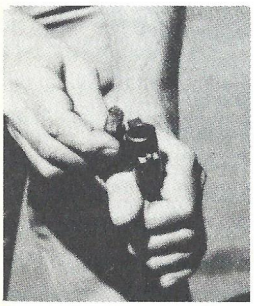
3

4

5

Loading a Minie Ball

Start the Minie (skirt down) into the muzzle with your fingers. Now, use the ram rod to push the bullet down tight against the powder. Remove the ram rod and place a percussion cap on the nipple. The rifle is now ready to shoot.



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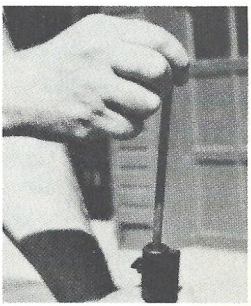
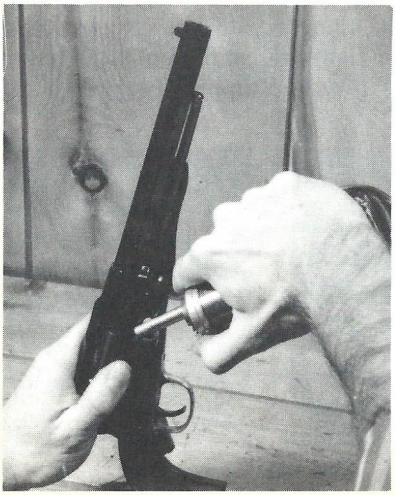
2



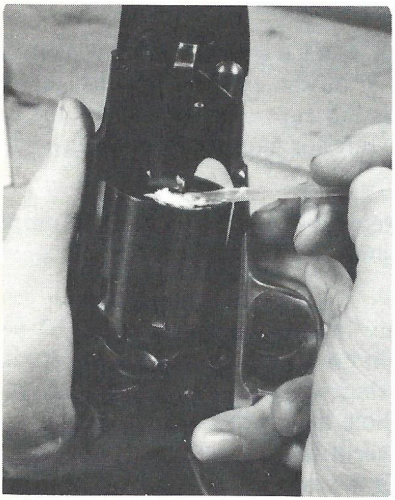
3

Loading a Black Powder Revolver

Before charging your pistol, make sure all six chambers are empty, then place percussion caps on all six nipples and fire them in a safe direction. The blast from the caps will dry up any oil which has accumulated in the nipples or chamber, and insure ignition. Once this is done, place the hammer of the pistol in the half-cock position. This will enable you to rotate the cylinder in order to charge each of the chambers. Pour a measured amount of powder into each chamber and place a ball, sprue up, over the powder in the mouth of one of the chambers.



Do not use a cloth patch. The gap on all revolvers between the cylinder and the barrel makes these guns incapable of firing a patched ball. Additionally, using a tightly fitting round ball makes the use of a patch unnecessary. If a round ball is being used, make certain that the sprue mark is up and carefully centered in the chamber. If a conical bullet is to be used, then even more care is required to center the bullet in the chamber. Using care, turn your cylinder so that the projectile is directly in line with the loading ram. Pull down on the loading lever and seat the projectile friction-tight on the powder charge. Load all six chambers in this manner, trying at the same time to be consistent, and seat each bullet with the same amount of pressure. Bullets must be seated flush or below the mouth of the chamber to prevent jamming the gun.



Next, clear away any powder that has adhered to the face of the cylinder and fill the remainder of each chamber with a lubricant or heavy grease, like Crisco. The grease acts as a bullet lubricant and reduces the possibility of multi-ignition. Last, prime the pistol by placing a percussion cap on each of the six nipples. When this is done, the pistol is ready to fire.

If the pistol is to be carried in a holster, it is best to leave one chamber empty and rest the hammer on the nipple over the empty chamber. The only exception to this would be those revolvers which have a special detent allowing the hammer to rest in a notch between chambers.

Misfires and Hangfires

Because of the high quality of modern ammunition, a misfire is seldom experienced with today's firearms. With muzzle loading guns, however, it is sometimes the nature of the beast to become obstinate. Misfires are quite common, particularly if the shooter is careless in cleaning or caring for his firearm. This applies to all muzzle loading guns, not just percussion revolvers. The percussion revolver, because it has more chambers and nipples to keep clean and in good repair, can become the worst offender.

Several things can cause a misfire, but the most common is powder fouling which builds up and closes off the flash hole in the nipple. A piece of thin copper wire is a handy tool for cleaning powder that fouls the nipple hole. You should inspect each nipple before loading to make sure it is not blocked with fouling.

If a nipple becomes worn or chipped, replace it. Poor contact between the hammer and the nipple may not set off the cap and this, too, can be troublesome. Also, good grade percussion caps are a must, for there is nothing more aggravating than old or inferior caps that do not fire when struck by the hammer.

The best way to avoid misfires is to keep your gun clean and the nipples in good condition. Do not snap the hammer unless a cap is in place, and use only good grade percussion caps.

If you should have a misfire with any muzzle loading firearm, be very careful. Treat the firearm as if it might go off at any minute. It certainly could! After a reasonable lapse of time, reprime the piece and try it again. But first clean out the nipple hole and sprinkle a few granules of powder into the hole itself. If the firearm is a percussion revolver, wait at least one full minute before rotating the cylinder to reprime the nipple.

Preservation Of Black Powder Guns

No discussion about black powder shooting can be complete without mentioning the cleaning and preservation of these guns. Black powder shooting is messy, to say the least. After an afternoon of enjoyment, both you and your gun are covered with great quantities of black, sooty residue which clings to everything it touches. It may not cause much harm to you as a shooter, but it can be disastrous to your gun if it is left for any period of time. This burned black powder residue is very hygroscopic. In other words, it absorbs moisture from the air very rapidly. And the moisture will cause the metal of your gun to begin rusting in only a matter of hours, especially in a humid climate. Thus, the correct cleaning and preservation of the gun is most important to insure a reasonable life for your firearm. There are a number of "black powder solvents" on the market today which will soften the residue left from black powder shooting and will extend the period of time which the gun may lie uncleaned. However, these are in no way a substitute for a good, thorough cleaning.

Cleaning The Black Powder Rifle

First, place your gun in a muzzle-up position against a bench or table. Cock the hammer, place a bit of inner tube or rubber over the nipple, and then let the hammer down to hold this in place. This will seal the barrel, which you may now fill with hot, soapy water. Allow this hot water to sit and soften the fouling in the barrel for a period of time. Then pour this water out of the barrel and run a soapy patch through the bore. Continue to run soapy patches through the bore until they come out clean. Then, fill the bore with hot water again, this time with no soap in it. Pour it out and repeat this operation.

The hot water will remove the soap suds and, in addition, will heat the barrel sufficiently to promote rapid drying, thus leaving no moisture inside the bore. Now run dry patches through the bore until they come out perfectly clean. Next, remove the fouling around the breech area of your rifle with a moist rag. To remove fouling from crevices and other hard-to-get-at places, an old toothbrush may be helpful. Don't miss any small crevice. Wipe everything dry. With all the black powder fouling removed, both inside and out, lightly oil the metal on your rifle. If any sludge or fouling has landed on the stock, this may be removed with a moist (but not wet) rag, or a very dry lather of soap. With the soap removed from the stock, a bit of paste wax or your favorite stock preserver will bring the stock back to par.

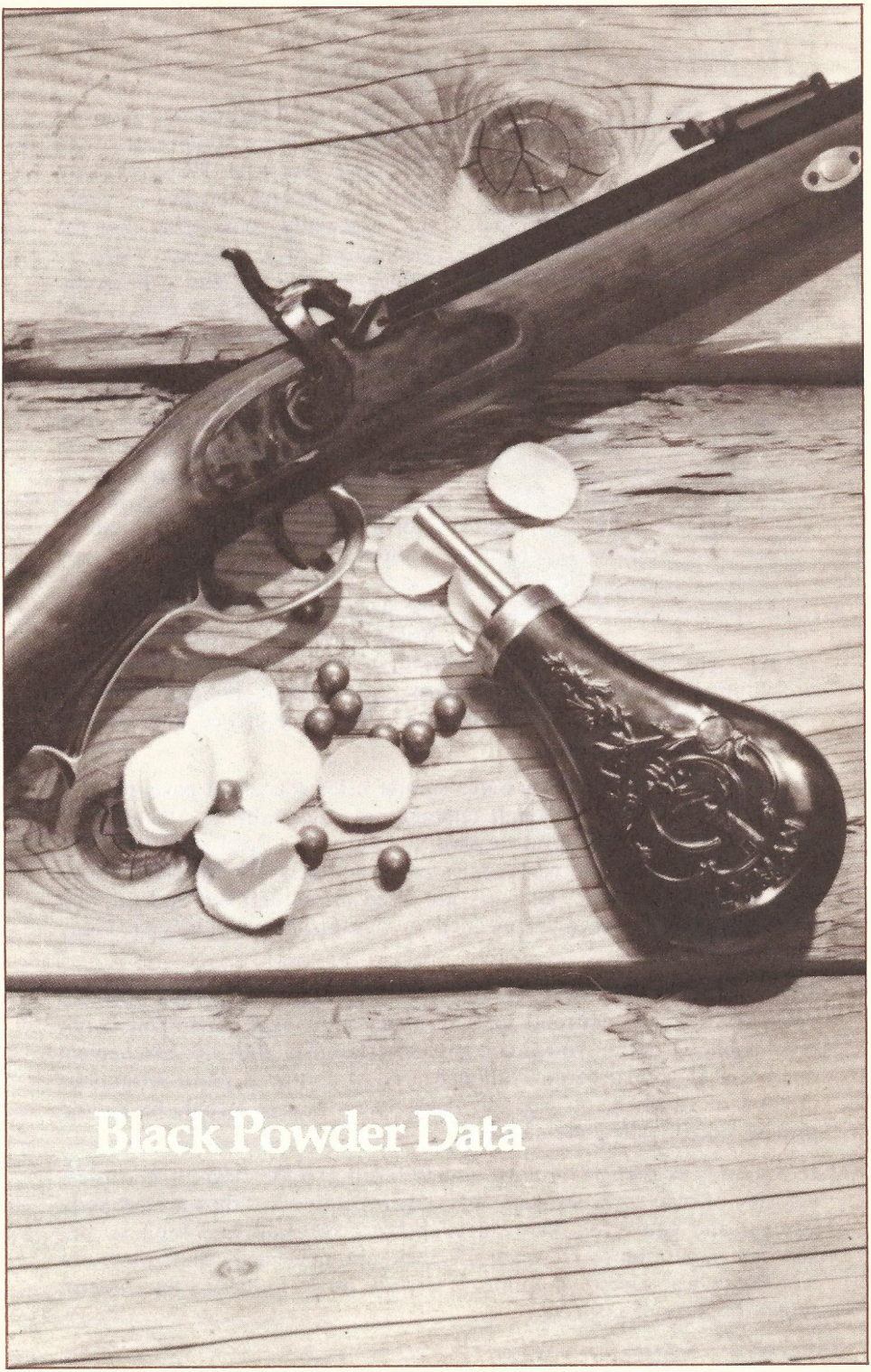
Cleaning The Cap and Ball Revolver

Cleaning of a cap and ball revolver is somewhat more complicated than the single shot rifle. However, here again, scrupulous cleaning is essential, especially considering that the mechanism of a revolver, while reliable, is delicate and will suffer from any rusting or corrosion caused by black powder fouling. First, the revolver must be broken down. The cylinder and loading lever are removed from the frame and the grips are taken off. At this point, there are a number of ways of cleaning your revolver. One method is to let the individual metal parts (that means without the grips) soak in hot soapy water. After a period of soaking, the parts are removed and swabbed inside and out to remove heavy fouling. The parts are then immersed in fresh soapy water and the procedure is repeated. Then the parts go into fresh, boiling hot water with no soap for a rinse. Finally, the parts are removed and allowed to dry.

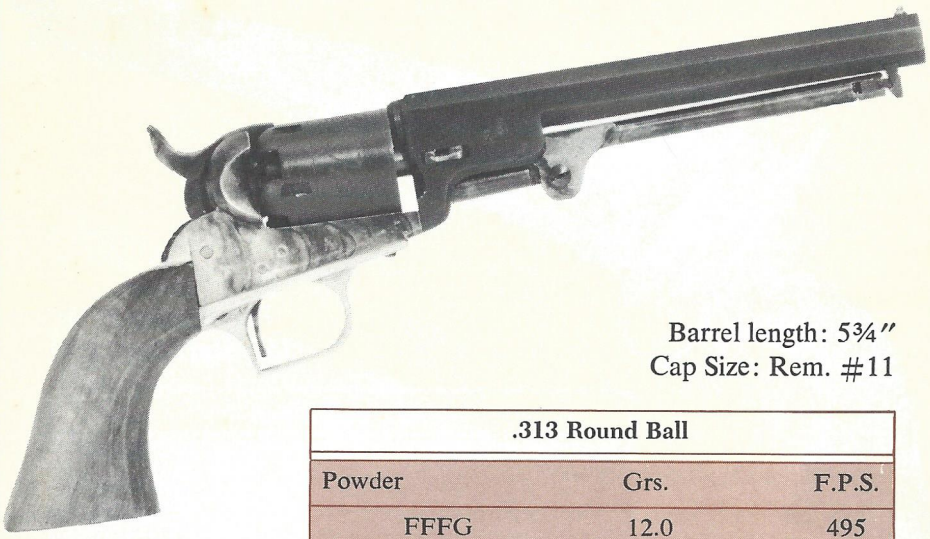
The successive hot baths of water should bring the metal parts of your revolver up to a high enough temperature to rapidly dry themselves. However, it is often helpful to place the parts in a 200° oven to insure that all the tiny nooks and crannies are completely dry. With the cleaning operation complete, all parts are oiled inside and out and the gun is reassembled. A revolver cleaned in this fashion should give many years of service.

Some people prefer, however, to completely disassemble their revolver down to its tiniest part and soak all of the individual parts. This is not recommended unless you are completely familiar with the mechanical operation of your firearm. Although it is, of course, a more scrupulous method of cleaning, proper adherence to the above techniques should provide equally adequate cleaning.

If it sounds as though we have unduly belabored the cleaning and preservation of black powder guns, it is only because when they are properly cleaned and cared for, these black powder originals and replicas will last for generations. However, if they are neglected, they may not last through a season's shooting. It is truly tragic to have a fine firearm ruined because of neglect.


Black Powder Data

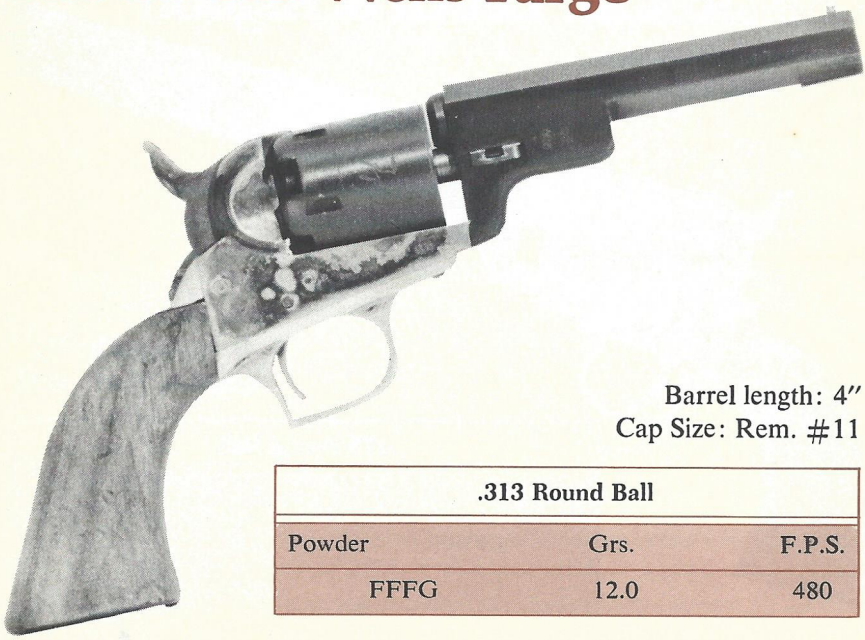
The .31 Cal. Baby Dragoon



Barrel length: 5¾″
Cap Size: Rem. #11

.313 Round Ball		
Powder	Grs.	F.P.S.
FFFG	12.0	495

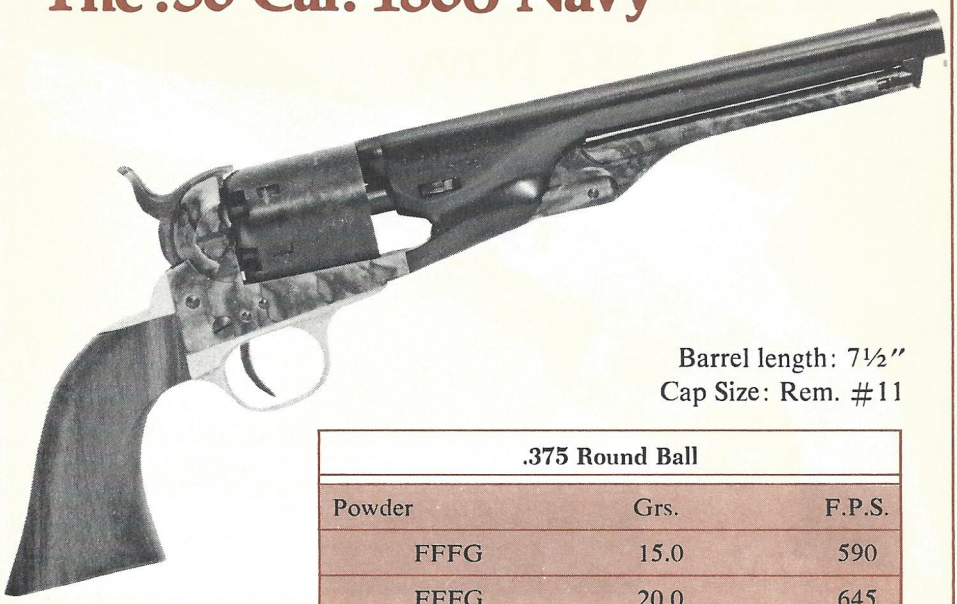
The .31 Cal. Wells Fargo



Barrel length: 4″
Cap Size: Rem. #11

.313 Round Ball		
Powder	Grs.	F.P.S.
FFFG	12.0	480

The .36 Cal. 1860 Navy



Barrel length: 7½″
Cap Size: Rem. #11

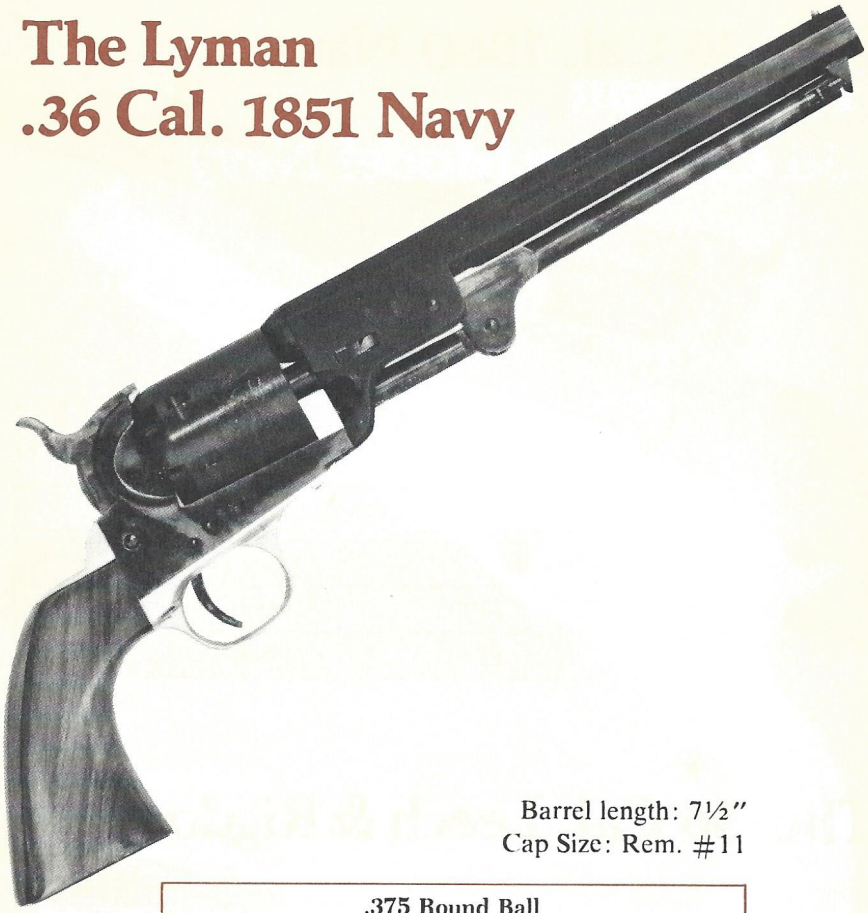
.375 Round Ball		
Powder	Grs.	F.P.S.
FFFG	15.0	590
FFFG	20.0	645

The .36 Cal. Leech & Rigdon

Barrel Length: 7½″
Cap Size: Rem. #11

.375 Round Ball		
Powder	Grs.	F.P.S.
FFFG	15.0	590
FFFG	20.0	715

The Lyman .36 Cal. 1851 Navy



Barrel length: 7½"
Cap Size: Rem. #11

.375 Round Ball		
Powder	Grs.	F.P.S.
FFG	20.0	705
FFFG	20.0	725

#37583 Conical 145 Grains (Pure lead)		
Powder	Grs.	F.P.S.
FFG	15.0	430
FFFG	15.0	550

The Lyman .36 Cal. New Model Navy

Barrel length: 6½"
Cap Size: Rem. #11

.375 Round Ball		
Powder	Grs.	F.P.S.
FFG	25.0	685
FFFG	25.0	745

#37583 Conical 145 Grains (Pure lead)		
Powder	Grs.	F.P.S.
FFG	15.0	565
FFFG	15.0	685

The .36 Cal. Paterson

Barrel length: 9″
Cap Size: Rem. #11

.375 Round Ball		
Powder	Grs.	F.P.S.
FFFG	15.0	455

The .44 Cal. Sheriff's Model

Barrel length: 5″
Cap Size: Rem. #11

.451 Round Ball		
Powder	Grs.	F.P.S.
FFFG	25.0	620
FFFG	30.0	645

The Lyman .44 Cal. New Model Army

Barrel length: 7¾″
Cap Size: Rem. #11

.451 Round Ball		
Powder	Grs.	F.P.S.
FFG	20.0	555
FFG	35.0	775
FFFG	20.0	665
FFFG	35.0	785

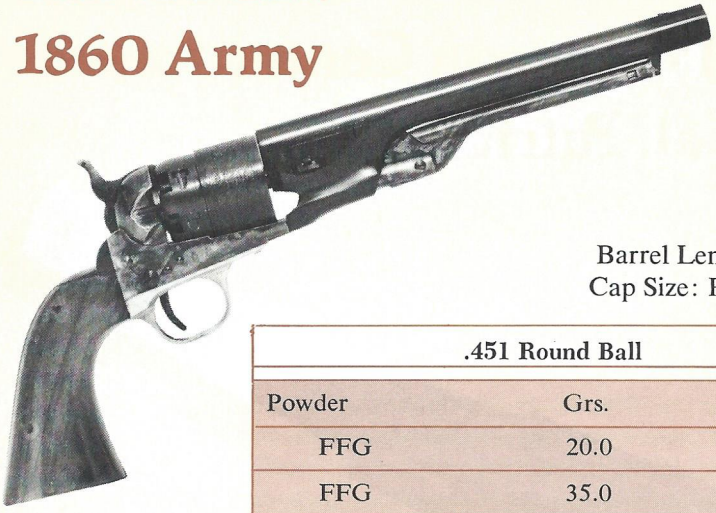
The Ruger .44 Cal. Old Army

Barrel Length: 7½″
Cap Size: Rem. #11

.457 Round Ball		
Powder	Grs.	F.P.S.
FFG	20.0	450
FFG	30.0	630
FFG	40.0	770
FFFG	20.0	535
FFFG	30.0	790
FFFG	40.0	920

Bullet #45468 175 Grs. (Pure Lead)		
FFFG	30.0	755

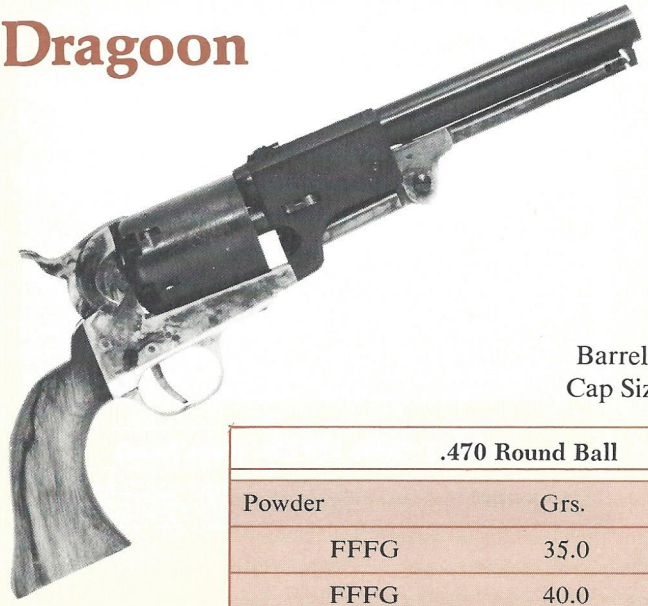
The .44 Cal. 1860 Army



Barrel Length: 7½″
Cap Size: Rem. #11

.451 Round Ball		
Powder	Grs.	F.P.S.
FFG	20.0	475
FFG	35.0	715
FFFG	20.0	635
FFFG	30.0	745

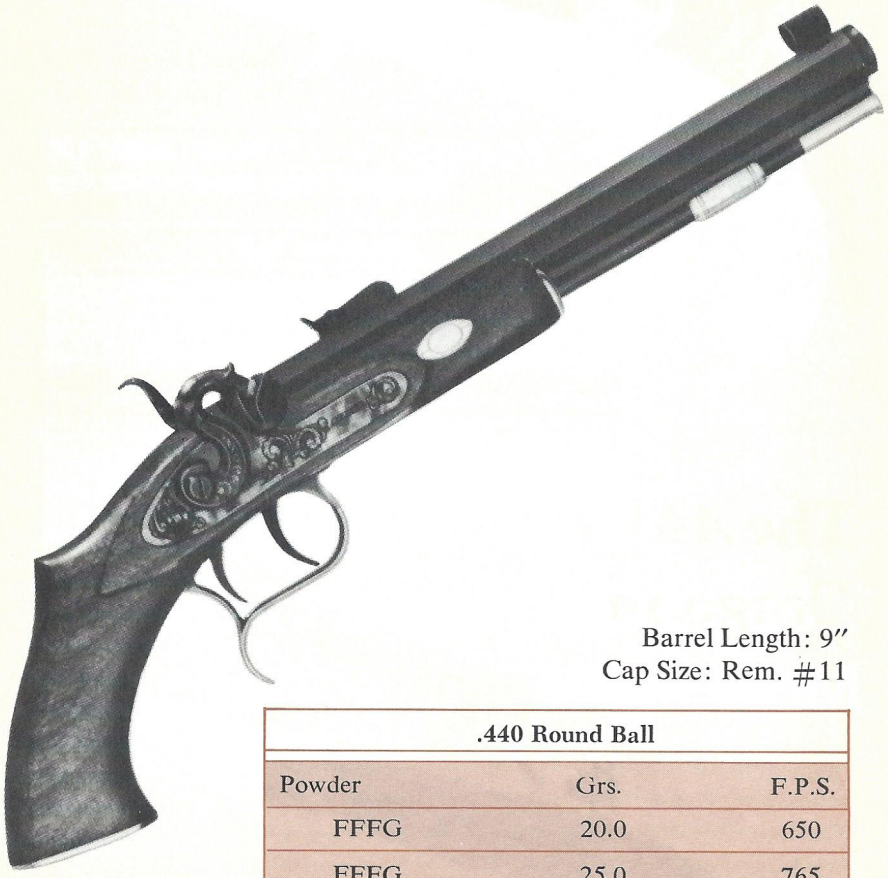
The .44 Cal. 3rd Model Dragoon



Barrel Length: 7¼″
Cap Size: Rem. #11

.470 Round Ball		
Powder	Grs.	F.P.S.
FFFG	35.0	640
FFFG	40.0	720

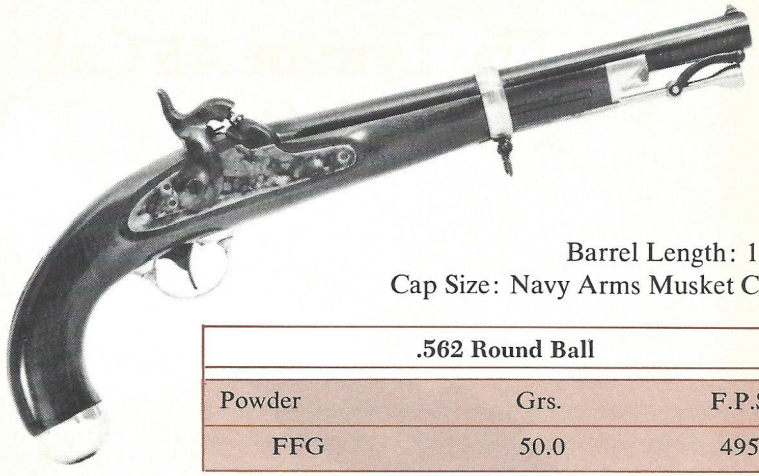
The Thompson Center .45 Cal. Patriot



Barrel Length: 9″
Cap Size: Rem. #11

.440 Round Ball		
Powder	Grs.	F.P.S.
FFFG	20.0	650
FFFG	25.0	765
FFFG	30.0	840
FFFG	35.0	900
FFG	40.0	950
FFG	45.0	990

The .58 Cal. Harper's Ferry Dragoon Model 1855



Barrel Length: 12″
Cap Size: Navy Arms Musket Cap

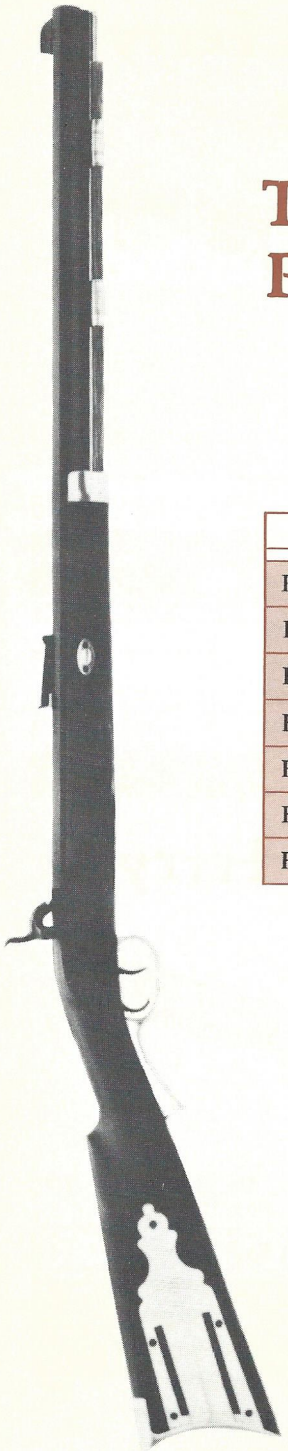
.562 Round Ball		
Powder	Grs.	F.P.S.
FFG	50.0	495

Bullet #575213		
Powder	Grs.	F.P.S.
FFG	50.0	425

The .58 Cal. Harper's Ferry Model 1806

Barrel Length: 10″

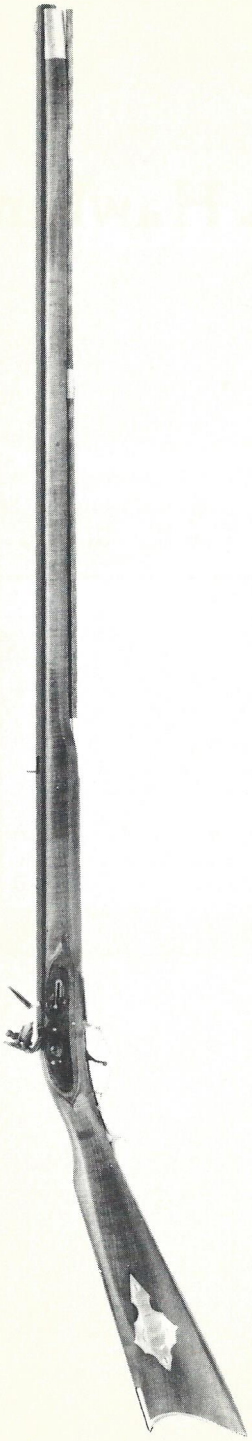
.562 Round Ball		
Powder	Grs.	F.P.S.
FFG	45.0	415



The Lyman .45 Cal. Plains Rifle

Barrel Length: 28″
Cap Size: Rem. #11

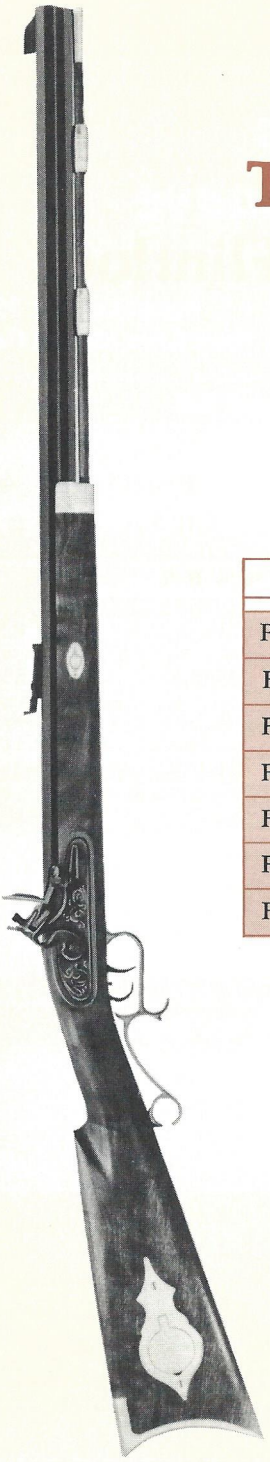
.440 Round Ball		
Powder	Grs.	F.P.S.
FFFG	50.0	1605
FFFG	60.0	1720
FFFG	70.0	1825
FFFG	80.0	1930
FFFG	90.0	2005
FFFG	100.0	2080



The .45 Cal. Kentucky Flintlock

Barrel Length: 40″
Cap Size: Rem. #11

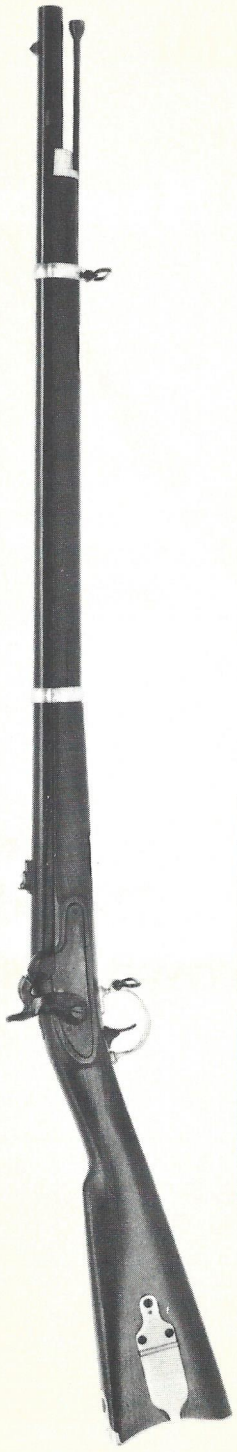
.445 Round Ball		
Powder	Grs.	F.P.S.
FFFG	45.0	1185
FFG	100.0	1900



The .50 Cal. Hawken

Barrel Length: 28″
Cap Size: Rem. #11

.490 Round Ball		
Powder	Grs.	F.P.S.
FFG	50.0	1355
FFG	60.0	1435
FFG	70.0	1645
FFG	80.0	1840
FFG	90.0	1950
FFG	100.0	2050



The Lyman .58 Cal. Zouave

Barrel Length: 33″
Cap Size: Navy Arms Musket Cap

.562 Round Ball		
Powder	Grs.	F.P.S.
FFG	65.0	915

Bullet #575602 400 Grs. (Pure Lead)		
Powder	Grs.	F.P.S.
FFG	50.0	640
FFG	60.0	825

Bullet #575213 505 Grs. (Pure Lead)		
Powder	Grs.	F.P.S.
FFG	50.0	765
FFG	60.0	820

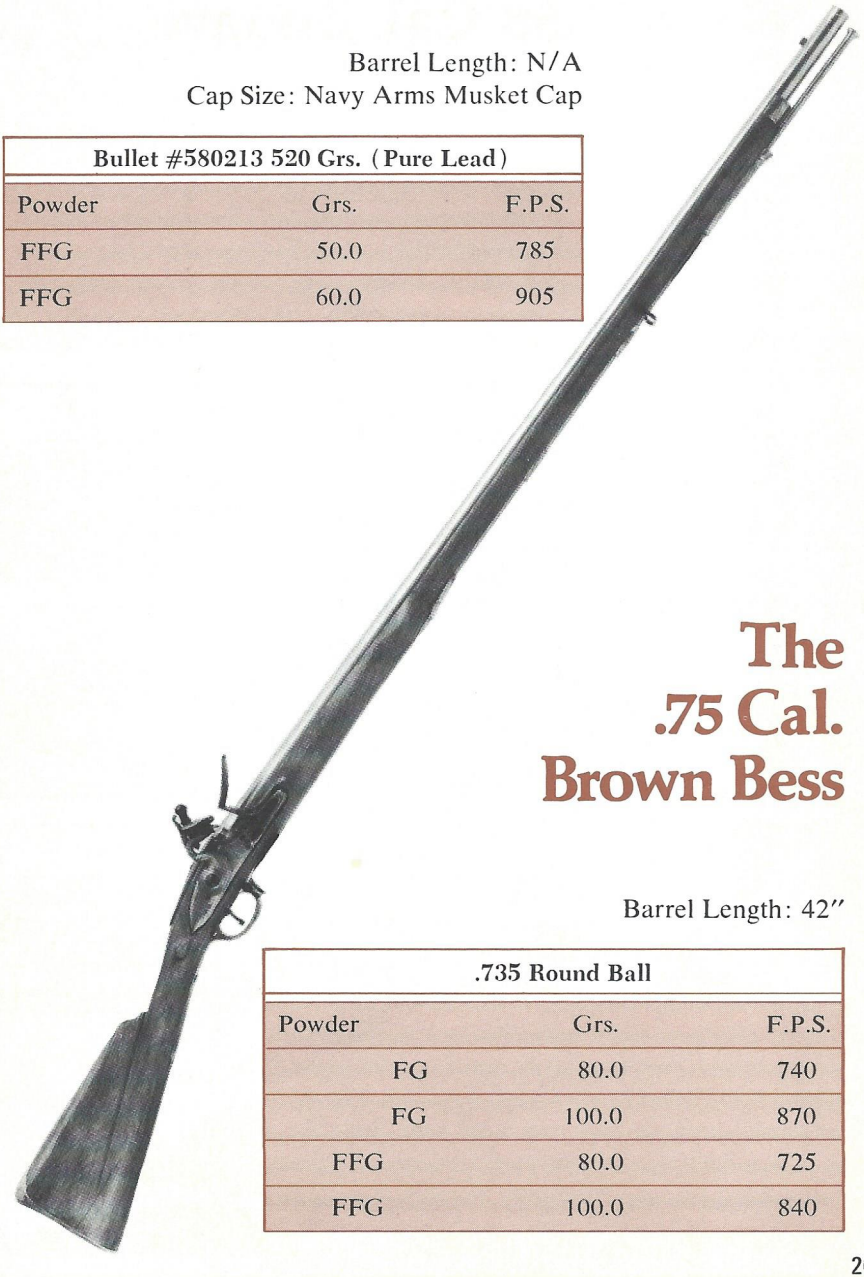
Bullet #57730 570 Grs. (Pure Lead)		
Powder	Grs.	F.P.S.
FFG	50.0	700
FFG	60.0	830

The Original Colt Special Model 1861

(Photo Unavailable)

Barrel Length: N/A
Cap Size: Navy Arms Musket Cap

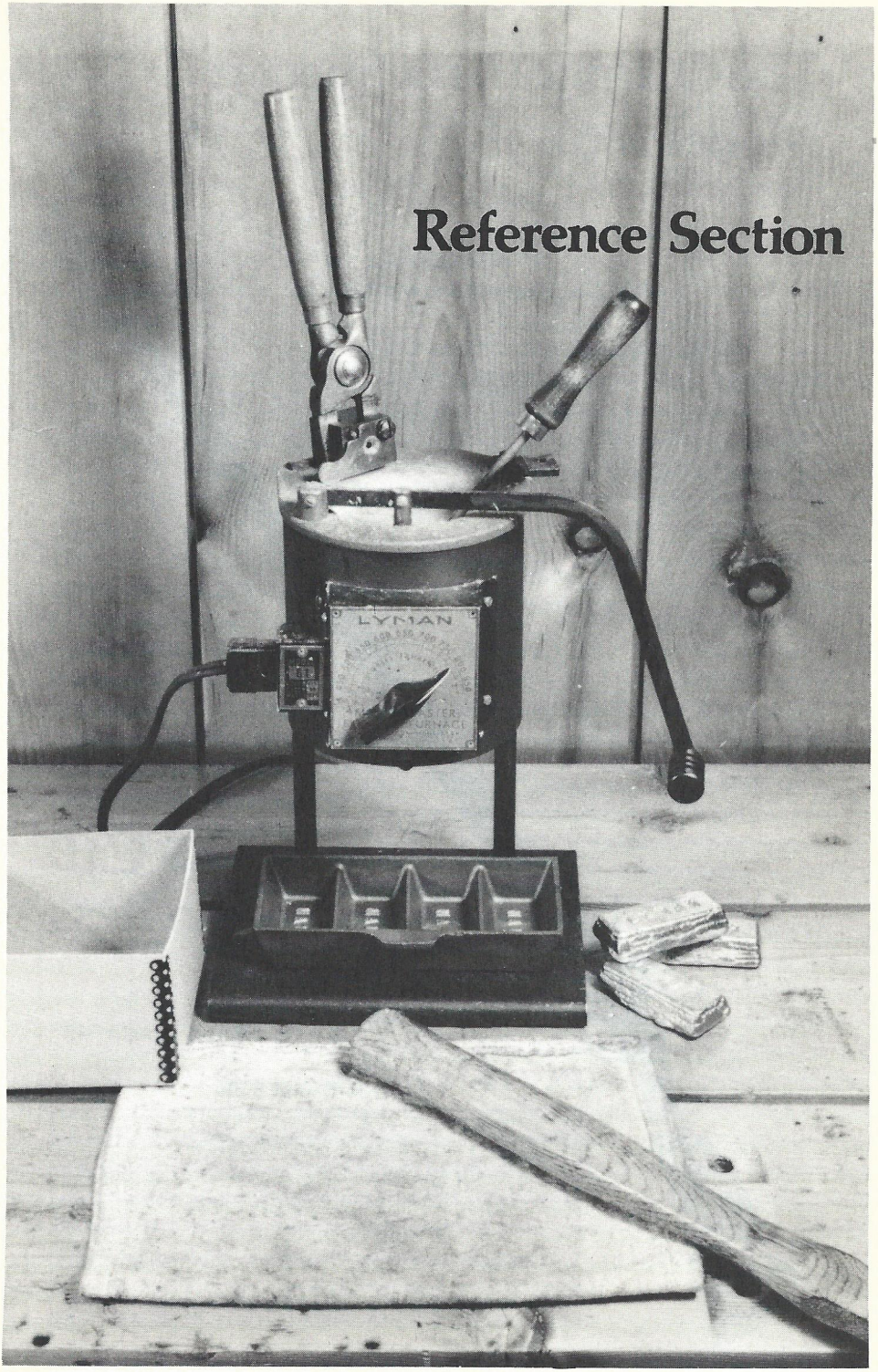
Bullet #580213 520 Grs. (Pure Lead)		
Powder	Grs.	F.P.S.
FFG	50.0	785
FFG	60.0	905



The .75 Cal. Brown Bess

Barrel Length: 42″

.735 Round Ball		
Powder	Grs.	F.P.S.
FG	80.0	740
FG	100.0	870
FFG	80.0	725
FFG	100.0	840



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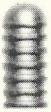
Bullet No.	22536	22596	225107	225209
				
Top Punch	415	415	415	438
Seating Screw	415	415	415	438
Weight (#2 Alloy)	40, 46, 54, 60, 69, 75, 84, 90, 98	50	37	18, 25, 33, 38, 44, 52

Bullet No.	225230	225322	225353	225415
Top Punch	438	415	415	415
Seating Screw	438	415	415	415
Weight (#2 Alloy)	47	55	43	49

Bullet No.	225438	225450	225462	225487
Top Punch	438	450	438	450
Seating Screw	438	450	438	450
Weight (#2 Alloy)	44	48	57	43

Bullet No.	22835	228367	244203	245496
Top Punch	450	450	203	203
Seating Screw	450	450	203	203
Weight (#2 Alloy)	29, 36, 44, 51, 59, 67, 78	59	60, 95	84

Bullet No.	245497	245498	252435	25716
Top Punch	203	498	203	420
Seating Screw	203	498	203	415
Weight (#2 Alloy)	93	99	51	90, 100, 110, 120, 130, 140

Bullet No.	25719	25720	25721	257205
Top Punch	418	420	420	420
Seating Screw	450	415	415	415
Weight (#2 Alloy)	70, 80, 90, 100, 110, 120, 130	46, 56, 67, 77, 86, 96	87	88

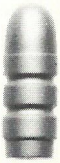
Bullet No.	257231	257283	257285	257306
Top Punch	420	420	420	420
Seating Screw	415	415	415	415
Weight (#2 Alloy)	66, 88, 106	85	87	115

Bullet No.	257312	257325	257382	257388
Top Punch	420	325	420	418
Seating Screw	415	438	415	450
Weight (#2 Alloy)	89	113	88	80

Bullet No.	257418	257420	257454	257463
Top Punch	418	420	463	463
Seating Screw	450	415	438	438
Weight (#2 Alloy)	98	65	92	75

Bullet No.	257464	263314	266305	266324
Top Punch	463	325	305	455
Seating Screw	438	438	305	438
Weight (#2 Alloy)	89	90	101	119

Bullet No.	266386	266455	266469	280411
Top Punch	386	455	455	411
Seating Screw	386	438	438	377
Weight (#2 Alloy)	105	127	141	138

Bullet No.	280412	280468	280473	287129
				
Top Punch	468	468	473	346
Seating Screw	438	438	377	438
Weight (#2 Alloy)	136	109, 114	125	124

Bullet No.	287202	287221	287308	287346
Top Punch	346	420	468	346
Seating Screw	438	415	438	438
Weight (#2 Alloy)	84, 120	90, 105, 120, 135, 150, 165, 175	164	135

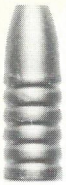
Bullet No.	287373	287377	287405	287442
Top Punch	420	377	346	377
Seating Screw	415	377	438	377
Weight (#2 Alloy)	122	148	150	139

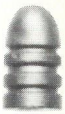
Bullet No.	287448	291379	294380	299153
Top Punch	348	379	473	465
Seating Screw	438	379	377	465
Weight (#2 Alloy)	118	138	189	90

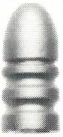
Bullet No.	299155	300136	3111	3112
Top Punch	465	465	8	465
Seating Screw	465	465	8	465
Weight (#2 Alloy)	80	146	200, 215, 245	165, 182, 201

Bullet No.	3113	3118	31110	31114
Top Punch	8	8	465	8
Seating Screw	8	8	465	8
Weight (#2 Alloy)	158, 174. 188, 204, 219	115	100	75, 100, 125, 150, 175, 200

Bullet No.	31123	31125	31133	31141
Top Punch	8	465	8	8
Seating Screw	8	465	8	8
Weight (#2 Alloy)	125	240	100	173

Bullet No.	311157	311206	311224	311227
				
Top Punch	8	465	465	465
Seating Screw	8	465	465	465
Weight (#2 Alloy)	165	125, 170	195	90

Bullet No.	311234	311240	311241	311245
				
Top Punch	8	465	465	465
Seating Screw	8	465	465	465
Weight (#2 Alloy)	120	92	125, 155	87

Bullet No.	311252	311255	311257	311259
				
Top Punch	465	465	465	467
Seating Screw	465	465	465	467
Weight (#2 Alloy)	77	115	110	150, 175, 200

Bullet No.	311264	311274	311278	311280
Top Punch	8	346	278	278
Seating Screw	8	438	278	278
Weight (#2 Alloy)	125, 154	195	197	196

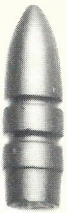
Bullet No.	311281	311282	311284	311288
Top Punch	8	467	467	467
Seating Screw	8	467	467	467
Weight (#2 Alloy)	175	217	214	175

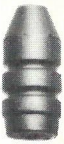
Bullet No.	311290	311291	311299	311316
Top Punch	467	291	467	8
Seating Screw	467	465	467	8
Weight (#2 Alloy)	210	170	202	112

Bullet No.	311329	311331	311332	311333
Top Punch	329	278	413	278
Seating Screw	329	278	413	278
Weight (#2 Alloy)	185	218	180	197

Bullet No.	311334	311335	311340	311351
Top Punch	413	467	329	329
Seating Screw	413	467	413	329
Weight (#2 Alloy)	190	206	188	158

Bullet No.	311359	311365	311375	311397
Top Punch	359	329	413	329
Seating Screw	359	329	413	329
Weight (#2 Alloy)	115	198	168	153

Bullet No.	311403	311407	311410	311413
				
Top Punch	8	445	467	413
Seating Screw	8	445	467	413
Weight (#2 Alloy)	167	180	130	169

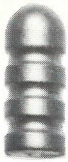
Bullet No.	311414	311419	311440	311441
				
Top Punch	329	8	8	8
Seating Screw	329	8	8	295
Weight (#2 Alloy)	150	88	147	117

Bullet No.	311465	311466	311467	311576
Top Punch	465	467	467	465
Seating Screw	465	467	467	465
Weight (#2 Alloy)	122	152	177	120

Bullet No.	31355	31356	31357	313226
Top Punch	465	8	8	226
Seating Screw	465	8	8	226
Weight (#2 Alloy)	85	125	100	93

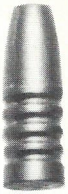
Bullet No.	313249	313260	313307	313445
Top Punch	226	445	226	445
Seating Screw	226	445	226	445
Weight (#2 Alloy)	84	100, 124, 146, 173	220	95

Bullet No.	313492	313493	316204	316275
Top Punch	445	8	470	470
Seating Screw	445	8	470	470
Weight (#2 Alloy)	93	104	170	200

Bullet No.	316475	31947	31948	31950
				
Top Punch	470	295	470	295
Seating Screw	470	295	470	295
Weight (#2 Alloy)	155	105, 120, 135, 150, 165, 180, 195, 210	50, 120, 155	105

Bullet No.	31952	319162	319247	319261
Top Punch	295	295	295	295
Seating Screw	295	295	295	295
Weight (#2 Alloy)	196	185	165	150

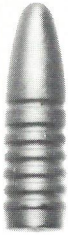
Bullet No.	319273	319289	319295	319323
Top Punch	295	295	295	467
Seating Screw	295	295	295	467
Weight (#2 Alloy)	185	185	174	181

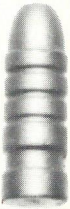
Bullet No.	319350	32115	321232	321265
				
Top Punch	295	295	295	295
Seating Screw	295	295	295	295
Weight (#2 Alloy)	195	125, 150, 175	170	153

Bullet No.	321297	321298	321317	321427
Top Punch	295	295	470	470
Seating Screw	295	295	470	470
Weight (#2 Alloy)	181	151	161	134

Bullet No.	32359	32360	32361	32362
Top Punch	295	295	366	470
Seating Screw	295	295	366	470
Weight (#2 Alloy)	115	75, 103, 125, 150, 175, 200, 225	98	83

Bullet No.	323236	323357	323366	323378
Top Punch	467	295	366	470
Seating Screw	467	295	366	470
Weight (#2 Alloy)	188	183	182	243

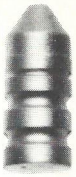
Bullet No.	323470	323471	323481	328371
				
Top Punch	470	366	278	366
Seating Screw	470	278	471	366
Weight (#2 Alloy)	165	215	185	151

Bullet No.	33889	338237	338320	338337
				
Top Punch	320	320	320	447
Seating Screw	320	320	320	447
Weight (#2 Alloy)	247	145, 195	201	224

Bullet No.	350293	350319	350447	350457
Top Punch	293	447	447	447
Seating Screw	293	447	447	447
Weight (#2 Alloy)	165	167	183	250

Bullet No.	350482	354433	356402	356404
Top Punch	320	447	402	495
Seating Screw	320	447	402	495
Weight (#2 Alloy)	251	158	121	95

Bullet No.	356472	357443	357446	357453
Top Punch	429	395	429	429
Seating Screw	429	395	429	429
Weight (#2 Alloy)	140	158	162	151

Bullet No.	357511	357512	3589	35842
				
Top Punch	203	203	430	395
Seating Screw	203	203	430	395
Weight (#2 Alloy)	107	130	282	195

Bullet No.	35863	35864	35870	35871
Top Punch	344	311	311	311
Seating Screw	344	311	311	311
Weight (#2 Alloy)	148	140	150	146

Bullet No.	35872	35873	35875	35887
Top Punch	430	430	429	311
Seating Screw	430	430	429	395
Weight (#2 Alloy)	115	105	160, 200	125, 140

Bullet No.	35891	35893	35897	358101
Top Punch	495	93	97	495
Seating Screw	495	93	97	495
Weight (#2 Alloy)	148	125	232	75

Bullet No.	358156	358160	358212	358242
Top Punch	429	311	311	311
Seating Screw	429	311	311	311
Weight (#2 Alloy)	155	150	146	92, 121

Bullet No.	358250	358269	358271	358302
Top Punch	311	311	429	302
Seating Screw	311	311	429	302
Weight (#2 Alloy)	156	129	150	112

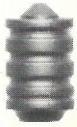
Bullet No.	358311	358313	358315	358318
Top Punch	311	449	311	311
Seating Screw	311	449	311	311
Weight (#2 Alloy)	158	170	204	245

Bullet No.	358339	358344	358345	358356
Top Punch	430	344	429	430
Seating Screw	430	344	429	430
Weight (#2 Alloy)	136	150	115	108

Bullet No.	358363	358385	358394	358395
Top Punch	395	311	430	395
Seating Screw	395	311	430	395
Weight (#2 Alloy)	70	150	87	148

Bullet No.	358416	358425	358429	358430
Top Punch	311	402	429	430
Seating Screw	311	402	429	430
Weight (#2 Alloy)	158	112, 121	168	150, 195

Bullet No.	358431	358432	358477	358480
Top Punch	429	429	429	429
Seating Screw	429	429	429	429
Weight (#2 Alloy)	160	148, 160	150	133

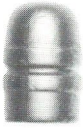
Bullet No.	358495	358500	358502	358503
				
Top Punch	495	203	203	203
Seating Screw	495	203	203	203
Weight (#2 Alloy)	141	149	119	125

Bullet No.	366408	37578	37579	37580
Top Punch	295	167	449	80
Seating Screw	429	167	449	97
Weight (#2 Alloy)	245	260	135, 170, 190, 205, 245, 285, 325	250

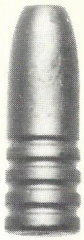
Bullet No.	37581	37582	37583	37584
Top Punch	167	449	449	449
Seating Screw	167	449	449	449
Weight (#2 Alloy)	253	170	145	156, 176, 197, 218, 238, 259, 280, 301, 322

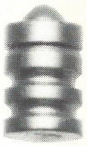
Bullet No.	37586	375164	375165	375166
Top Punch	449	449	449	449
Seating Screw	449	449	449	449
Weight (#2 Alloy)	265	190	250	330

Bullet No.	375167	375248	375272	375296
Top Punch	167	449	449	449
Seating Screw	167	449	449	449
Weight (#2 Alloy)	267	249	310	265

Bullet No.	375355	375449	386177	386178
				
Top Punch	449	449	167	178
Seating Screw	449	449	167	178
Weight (#2 Alloy)	238	264	196	200

Bullet No.	40143	40188	401452	40392
Top Punch	43	43	452	43
Seating Screw	43	88	452	43
Weight (#2 Alloy)	172	170	196	190, 225, 260, 295, 330

Bullet No.	40395	403168	403169	403171
				
Top Punch	95	43	43	88
Seating Screw	95	43	43	88
Weight (#2 Alloy)	145, 195	200	245	370

Bullet No.	403172	403173	406150	41026
				
Top Punch	88	43	43	402
Seating Screw	88	43	43	402
Weight (#2 Alloy)	285	250, 290	330	199

Bullet No.	41027	41028	41032	410214
Top Punch	402	43	429	43
Seating Screw	402	43	429	43
Weight (#2 Alloy)	217	212	200, 205, 212 STD, 215, 220, 225	101, 141, 181

Bullet No.	410219	410426	410459	410610
Top Punch	43	263	610	610
Seating Screw	43	263	429	429
Weight (#2 Alloy)	375	240	220	215

Bullet No.	412174	412263	415175	419180
Top Punch	43	263	43	263
Seating Screw	43	263	43	263
Weight (#2 Alloy)	260	288	300	200

Bullet No.	419181	42798	427100	427103
Top Punch	43	98	263	263
Seating Screw	43	98	263	263
Weight (#2 Alloy)	285	205	168	400

Bullet No.	429106	429184	429185	429215
Top Punch	251	251	303	421
Seating Screw	251	251	303	421
Weight (#2 Alloy)	161	235	210	210

Bullet No.	429220	429244	429251	429303
Top Punch	220	421	251	303
Seating Screw	220	421	251	303
Weight (#2 Alloy)	175	245	255	200

Bullet No.	429336	429348	429352	429360
Top Punch	421	348	348	360
Seating Screw	421	348	348	360
Weight (#2 Alloy)	250	180	245	232

Bullet No.	429383	429384	429398	429421
Top Punch	251	251	98	421
Seating Screw	251	251	98	421
Weight (#2 Alloy)	245	241	248	245

Bullet No.	429422	429436	429478	429508
Top Punch	421	251	251	203
Seating Screw	421	251	251	203
Weight (#2 Alloy)	235 H.B.	214	210	220

Bullet No.	429509	429510	429513	429518
Top Punch	449	203	203	203
Seating Screw	449	203	203	203
Weight (#2 Alloy)	170	190	150	245

Bullet No.	436218	439186	441267	445369
Top Punch	360	187	421	421
Seating Screw	360	187	421	421
Weight (#2 Alloy)	205, 245, 285, 365	370	360	291

Bullet No.	445599	446109	446110	446187
Top Punch	190	421	421	187
Seating Screw	190	421	421	187
Weight (#2 Alloy)	250	340	340	330, 400, 470

Bullet No.	450225	450229	451112	451113
Top Punch	374	460	449	187
Seating Screw	374	460	449	187
Weight (#2 Alloy)	170	155	275, 325, 380, 430, 485	305, 365, 405

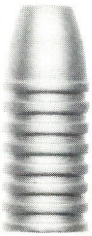
Bullet No.	451114	45266	452374	452389
Top Punch	421	460	374	374
Seating Screw	421	460	374	374
Weight (#2 Alloy)	450	215	225	185

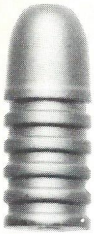
Bullet No.	452400	452423	452428	452460
Top Punch	374	424	348	460
Seating Screw	374	424	348	460
Weight (#2 Alloy)	240	238	230	200

Bullet No.	452484	452486	452488	452490
Top Punch	374	460	374	424
Seating Screw	374	460	374	424
Weight (#2 Alloy)	225	193	195	230

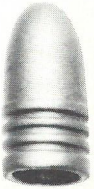
Bullet No.	452491	452505	45467	45468
Top Punch	424	203	374	460
Seating Screw	424	203	374	460
Weight (#2 Alloy)	220	190	200	175

Bullet No.	454190	454309	454424	454485
Top Punch	190	374	424	190
Seating Screw	190	374	424	190
Weight (#2 Alloy)	250	235	255	250

Bullet No.	454506	457102	457121	457122
				
Top Punch	203	191	191	191
Seating Screw	203	191	191	191
Weight (#2 Alloy)	190	445	215, 250, 295, 340, 385, 430, 475	290 HP, 330

Bullet No.	457124	457125	457126	457127
				
Top Punch	374	374	374	374
Seating Screw	374	374	374	374
Weight (#2 Alloy)	385	500	455	210

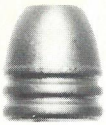
Bullet No.	457130	457131	457132	457191
Top Punch	130	190	374	191
Seating Screw	130	190	374	191
Weight (#2 Alloy)	145	285	415, 475, 535	292

Bullet No.	457192	457193	457195	457196
				
Top Punch	191	191	191	191
Seating Screw	191	191	191	191
Weight (#2 Alloy)	350	405	225	290

Bullet No.	457235	457401	457406	457483
Top Punch	374	401	374	191
Seating Screw	374	401	374	191
Weight (#2 Alloy)	505	193	475	378

Bullet No.	462560	465451	470216	500294
Top Punch	424	191	460	374
Seating Screw	424	191	460	374
Weight (#2 Alloy)	545	488	230, 285, 342, 368, 399, 417, 456, 516, 575	447

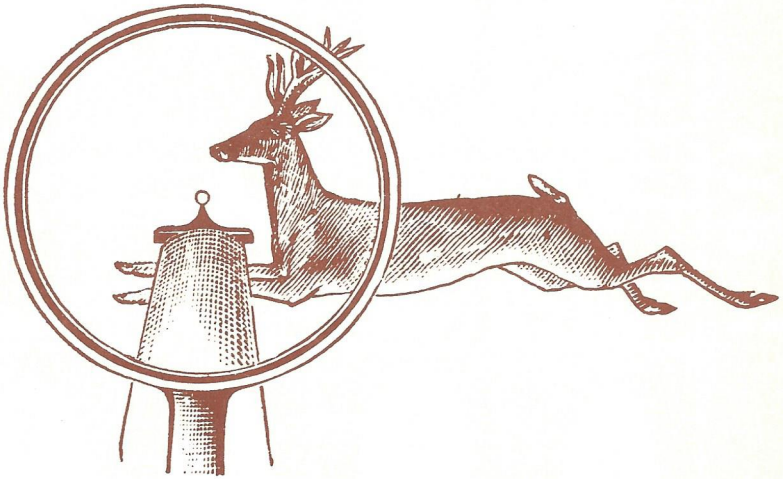
Bullet No.	509133	509134	512138	515139
Top Punch	191	191	191	191
Seating Screw	191	191	191	191
Weight (#2 Alloy)	385, 435, 465	360	450	290 HP, 330 Solid

Bullet No.	515141	515142	518144	518145
				
Top Punch	141	141	141	141
Seating Screw	141	141	141	141
Weight (#2 Alloy)	450	515	285	350

Bullet No.	53344	533476	538146	557456
Top Punch	N/A	N/A	N/A	N/A
Seating Screw	N/A	N/A	N/A	N/A
Weight (#2 Alloy)	415	410	347, 435, 524	475

Bullet No.	557489	575213	575213 0S	575387
Top Punch	N/A	580	N/A	N/A
Seating Screw	N/A	N/A	N/A	N/A
Weight (#2 Alloy)	440	505	460	565

Bullet No.	575494	575602	57730	68569
Top Punch	N/A	N/A	N/A	N/A
Seating Screw	N/A	N/A	N/A	N/A
Weight (#2 Alloy)	315	400	570	730



H & I Die Diameter

.222	.223	.224	.225	.228	.243	.244	.245	.257	.258	.259	.263	.264
.266	.277	.278	.280	.284	.285	.287	.299	.301	.308	.309	.310	.311
.312	.313	.314	.315	.316	.318	.319	.320	.321	.322	.323	.325	.338
.340	.348	.350	.352	.354	.355	.356	.357	.358	.359	.360	.366	.375
.377	.378	.379	.380	.386	.400	.401	.403	.406	.410	.412	.414	.419
.424	.425	.427	.428	.429	.430	.431	.434	.439	.446	.450	.451	.452
.454	.456	.457	.459	.509	.512	.515	.580 (lub. only)					

BASIC GROOVE DIAMETERS

RIFLE

Caliber	Groove Dia.
All 22 cal. (except 22 Hi-power)	.224
.22 Hi-Power	.228
.243, .244, 6 M/M	.243
.256 Win. & All 25 cals.	.257
.264 Win., 6.5 M/M*	.264
.270 Win*	.277
7 M/M, .280 Rem., .284 Win.	.284
7.35 Carcano	.299
30 cals.	.308
7.62 Russian*	.310
32/20 Win.	.311
7.65 Mauser*	.311
.303 British*, 7.7 M/M Jap.*	.313
8 M/M Mauser (J Bore)	.318
8 M/M Mauser (S Bore)	.323
32 Win. Spec. 32 S. L. & 32 Rem.	.321
338 Win. & 33 Win.	.338
348 Win.	.348
35 Win. S. L. & 351 S. L.	.352
9 x 56 M/M & 9 x 57 M/M	.354
35 cal.	.358
375 H & H Mag.	.375
38/55*	.379
38/40	.400
401 S.L.	.406
405 Win.	.412
44/40 Win. Rifles	.428
44/40 Rem. Rifles	.425
444 Marlin	.430
11 Mauser*	.446
45/70 & 458 Win.	.457

PISTOL

Caliber	Groove Dia.
22 Jet	.222
30 Mauser	.309
30 Luger	.310
32 Auto	.311
32/20	.312
32 S & W & 32 Colt N.P.	.313
9 M/M Luger*	.354
38 A.C.P. & 380 Auto	.355
38 Special & 357 Mag.*	.357
38 S & W*	.360
38/40	.400
41 Colt	.406
41 S & W Mag.	.410
44/40 (revolver)*	.425
44 S & W Spec. & 44 Russian*	.429
44 Mag.*	.430
45 A.C.P.	.450
45 Auto Rim	.451
45 Colt*	.454
.455 Webley*	.457

*Wide variations in Groove Dia. Suggest you Slug barrel.

Lead Alloys For Cast Bullets

Experimentation with different alloys of lead and other metals can be one of the most rewarding experiences in casting and shooting your own bullets.

Lead alone is not generally suitable for making bullets except when black powder is to be used. For one reason, it is too soft to resist properly the thrust against the rifling. Also, bases of lead bullets are easily damaged in handling, and lead seems to have a nasty habit of rubbing off in streaks on the rifling, which destroys the accuracy of the barrel until it is removed.

Lead may be hardened by the addition of tin. Bullets made from a lead-tin alloy will take the rifling well when used with suitable powder charges. Tin (which melts at about 400° Fahrenheit) and lead (which melts at about 600° Fahrenheit) mix well. Lead-tin alloys have many characteristics to commend them to the reloader: they are easily melted over the kitchen stove, they flow freely, are less apt to cause leading in the barrel and generally make better bullets. Do not use too much tin (only a maximum of about 10% will alloy with the lead) for too much tin encourages leading in barrels that tend to lead.

Antimony (which melts at about 1,100°F.) can also be used to harden lead, although antimony should never be used without tin. The fact is that while a true alloy in the molten state, it will not remain mixed when the alloy solidifies or freezes. The antimony will crystallize out, and will be found as pure antimony surrounded by pure lead. True, a lead-antimony bullet will feel harder than a lead bullet, but when fired, the lead surrounding the antimony crystals will bear on the barrel and leading may result.

In a lead-tin-antimony mixture the antimony crystals will be present just the same, but they will be embedded in a lead-tin mixture. Alloys of lead and tin melt better, cast better and size better than those containing antimony only, but the presence of antimony in the alloy, especially for gas-check bullets in rifles, has an advantage. It hardens the alloy and raises the melting point, making the bullet less liable to gas-cutting or fusion. Because antimony expands when it cools, bullets with antimony alloys will cast larger than others.

While the following alloys need not be strictly adhered to, they will usually be found satisfactory for the purposes mentioned.

Revolvers—not softer than 1 part tin to 40 parts lead. Alloys as hard as 1 part tin to 10 parts lead or 1 part tin, 1 part antimony to 20 parts lead may be used with entire satisfaction. In general, pistol bullets are softer than rifle bullets, with about half as much tin being used.

Automatic Pistols—1 part tin to 10 parts lead or 1 part tin, 1 part antimony to 20 parts lead. Alloys as soft as 1 part tin to 20 parts lead can be used, but soft bullets are more liable to damage in handling.

Rifle, Plain Base Bullets—1 part tin to 15 lead with light loads. For normal loads use 1 part tin to 10 lead or a 10-1-1 mixture of lead, tin and antimony.

Rifles, Gas-Check Bullets—1 part tin to 10 parts lead or a 10-1-1 mixture of lead, tin, antimony.

Bullet Metal is available with following composition:

No. 2—10 parts lead, 1 part tin, 1 part antimony.

No. 4—1 part tin to 20 parts lead.

No. 6—1 part tin to 40 parts lead.

The alloys above can be varied to meet individual requirements. The best accuracy in

rifles cannot always be obtained without some experimenting. Sometimes rifle bullets prove to be temperamental because variations in the bullet alloy will give unexplainable changes in accuracy. It is an excellent plan for the bullet caster to keep a record of the alloys he uses and the results obtained with various powders and charges. However, such a record will be of little value unless commercially pure metals or alloys of definitely known composition are used. Block lead obtainable from plumbing shops cannot be relied upon to be pure.

Alloys made from scrap lead may be used with entire success, especially for revolver bullets. Some reloaders are situated in localities where it is difficult to get pure metals and of necessity have to use such scrap alloys as are at hand. There is no objection to this, but it will be difficult to duplicate an alloy exactly, once one batch has been used up.

The following is the best available information on commercially available metals you may be able to get for your bullet casting. The percentages given are average. They are not exact for the simple reason that the uses to which commercial alloys are put to do not require exact alloying, or these alloys may be varied to meet individual conditions.

Standard Commercial Pig Lead (99.6% lead) may contain small amounts of tin, antimony, silver or zinc but in quantities so small that they have no appreciable hardening effect on the lead.

Block lead, as purchased in plumbing shops, may contain almost any amount of other metals. Its composition is very uncertain and it must be judged by its hardness. If it can be indented easily with the thumb nail, call it lead.

Block Tin is a name given to a commercial grade of tin which, while not pure, does not contain enough traces of other metals to amount to anything from the standpoint of making bullets.

Antimony usually contains some impurities that can be ignored, as the antimony is much harder than any small amounts of other metals that may be contained in it.

Lead Pipe—99.6% lead, same as standard commercial pig lead.

Cable Sheathing—98.5% lead. May contain small amounts of tin or antimony but can be considered pure lead.

Lead Storage-Battery Plates and Grids. 9% to 11% antimony, remainder lead. Always add at least 15% tin and soften as desired by the addition of lead.

Plumbers' Solder, used for making wiped joints, contains 67% lead and 33% tin.

Wiped Joints are not uniform in content but will usually be about 30% plumbers' solder and 70% lead pipe.

Type Metal varies but is usually about 3% tin, 82% lead and 15% antimony. Type metal of this composition makes a pretty good alloy for hard bullets just as it is.

.22-Caliber Bullets. It is sometimes possible to salvage lead from indoor rifle ranges where .22-caliber ammunition is used entirely. It will be found advantageous to add about 5% by weight of tin for most purposes and, for hard bullets, 10% of tin should be added.

Babbitt Metal for high-grade, heavy-duty bearings contains no lead at all but is composed of tin, antimony and copper. A common composition is 83% tin, 11% antimony and 6% copper. This is known as a tin-base babbitt.

Babbitt Metal for low-speed bearings has lead substituted for the tin. This is known as lead babbitt. We can suggest no convenient way of determining whether scrap babbitt metal has a lead or a tin base.

Wheel-Weight Metal contains 90% lead, 1% tin, and 9% antimony.

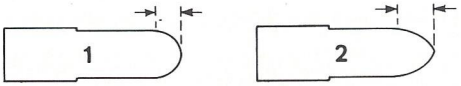
Cast Bullet Design

To get good results with cast bullets, the reloader should rid himself of any preconceived notion regarding the similarity between cast and jacketed bullets. Jacketed and cast bullets are beasts of a different breed and should be so regarded. First, let us consider the matter of shape and design. The jacketed bullet, due to its hardness which affords it a potentially high velocity, is often designed with a long flowing ogive. Generally speaking, such bullet styles will not stabilize, or not stabilize well, within the restrictions of the cast bullet velocity. Therefore, most of the popular cast bullet designs appear to be quite different in shape than the jacketed bullets to which we are accustomed.

In our extensive testing of cast bullets, we found that bullets with blunt or round noses were generally the most accurate. While many pointed bullets shoot well, the bullet must be of a design that has a relatively short ogive. Such bullets have their greatest weight mass bearing directly on some portion of the rifling (groove or bore) which gives the bullet maximum alignment in the throat and bore of the rifle. The following illustration will further clarify our test results and give the reader a better idea of those designs that offer the best potential. It should be understood, of course, that there are exceptions where one particular rifle may handle a long ogive bullet well. Our concern here is with the rule rather than the few exceptions.

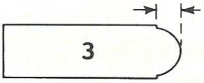
These four shapes are basic to cast bullet design. Actual bullets may vary to some extent, but, generally, they fall into one of these four categories.

(IDEAL DESIGNS) Bullets that conformed to either of these general shapes performed very well in our testing. Due to their short ogive, the greatest weight mass bears on some portion of the rifling. The driving bands bear directly on the groove, while the nose acts as a pilot to align the bullet in the throat and bore.



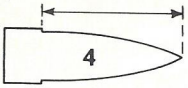
SHORT OGIVE SHORT OGIVE

(LOVERIN DESIGN) Bullets having this general shape performed extremely well in all of our testing. Due to their short ogive, the greatest weight mass bears directly on the groove. While the design does not always provide for a section of the bullet to bear on the lands, the many driving bands of groove diameter keep them well aligned.



SHORT OGIVE

Bullets of this general shape proved to be the worst performers in our testing. Their long flowing ogives leave a large portion of the bullet unsupported by the rifling. Cast bullets of this general shape can easily misalign themselves as they enter the throat and bore.



LONG OGIVE

If a cast bullet is to be driven at its maximum velocity (approximately 2,200 F.P.S.), then it must also be a design that allows for the use of a gas check. A gas check is a small, gilding metal cup which slips over the base of the cast bullet to protect it from hot powder gases. The gas check feature is not incorporated into all Lyman cast bullet designs. Plain base bullets are designed for a lower velocity of approximately 1,600 F.P.S.

PLAIN BASE DESIGN

Bullets of this design are usually restricted to approx. 1,600 F.P.S.

GAS CHECK DESIGN

The gas check fits snugly to bullet base and allows for a higher velocity of approx. 2,200 F.P.S. to be reached. Bullets of this design may also be used without the gas check, but when used in this manner, they must be held to the 1,600 F.P.S. velocity.

The cast lead alloy bullet is often referred to as the "lead bullet" which may lead the newcomer to assume these bullets are made of pure lead. Actually, cast bullets, for all purposes (with the exception of muzzle loading projectiles and shotgun slugs) are made from a rather tough lead alloy which is very similar in its hardness to Linotype alloy.

Over the years Lyman has developed three different lead alloy formulas for bullet making use. These alloys vary in their composition and are identified as: No. 2 Alloy, No. 4 Alloy and No. 6 Alloy. Consistent testing of thousands and thousands of cast bullets has proven the superiority of the No. 2 Alloy which is the hardest of these three materials (others do not contain antimony). *No. 2 Alloy is recommended for all cast bullet rifle and pistol loads shown in the Handbook.* Only pure lead should be used for shotgun slugs and muzzle loading bullets or round balls.

For additional information on components, we recommend that you contact their manufacturer. Card No. 1 (see right hand page) is provided for this purpose. To insure delivery, please print or write carefully and include your zip code number.

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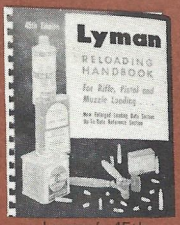
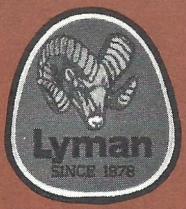


Lyman's 45th Handbook



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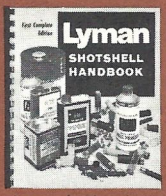
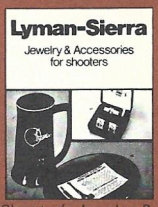


Lyman's Shotshell Handbook



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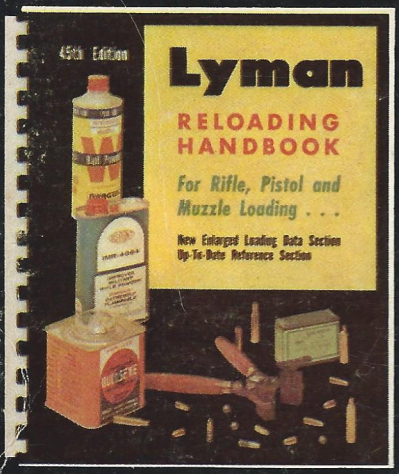

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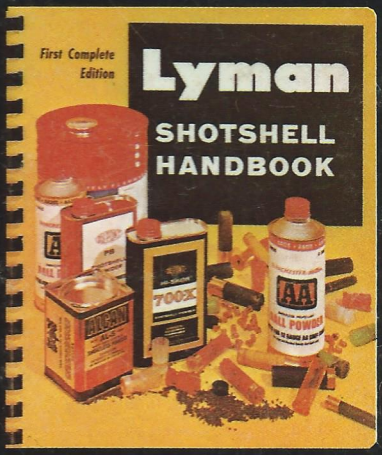

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